Health Canada Santé Canada

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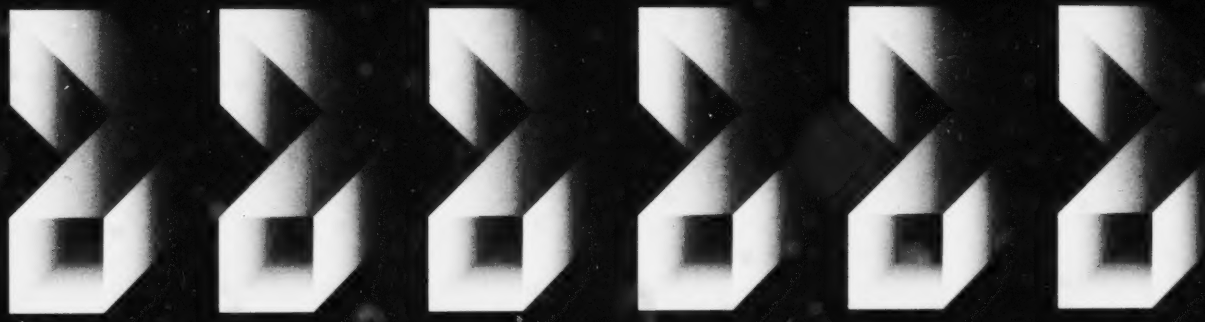

EVALUATION OF THE ACTION PLAN ON HEALTH AND THE ENVIRONMENT (APHE)

FINAL REPORT

November 1996

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MISSION STATEMENT

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Le Groupe de l'évaluation aide Santé Canada à mieux servir les Canadiens et les Canadiennes en offrant une information et des conseils objectifs sur l'efficacité des activités et des services du Ministère.

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Evaluation of the Action Plan on Health and the Environment (APHE)

Final Report

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Acknowledgement

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List of Acronyms

ADM - Assistant Deputy Minister
AECB - Atomic Energy Control Board
AES - Arctic Environmental Strategy
AFN - Assembly of First Nations
AHEP - Air Health Effects Program
ALEP - Active Living Environments Program
APHE - Action Plan on Health and the Environment
APHE/GPIC - Action Plan on Health and the Environment/Green Plan Implementation Committee
BCME - Bis (2-Chloromethyl) Ether
CAP - Community Animation Project
CEPA - Canadian Environmental Protection Act
CIDA - Canadian International Development Agency
CMME - Chloromethyl Methyl Ether
CNAC - Canadian Network of Asthma Care
CPHA - Canadian Public Health Association
CPSS - Canadian Perinatal Surveillance System
CSA - Canadian Standards Agency
CSB - Corporate Services Branch
DIAND - Department of Indian Affairs and Northern Development
DWMSA - Drinking Water Material Safety Act
DWSI - Drinking Water Safety Initiative
DWSPNP - Drinking Water Safety Program for Native People
EAGLE - Effects on Aboriginals from the Great Lakes Environment
ECS - Enhanced Cancer Surveillance
EHD - Environmental Health Directorate
EMF - Electromagnetic Field
EPA - Environmental Protection Agency
EQDB - Environmental Quality Database
ERDS - Environment-Related Disease Surveillance
ERR - Environmental Radiation and Radioactivity
FNERP - Federal Nuclear Emergency Response Plan
FY - Fiscal year
GIS - Geographic Information System
H.E.A.L. - Health and Environment Aboriginal Life
HC - Health Canada
HEP - Healthy Environments Program

HPB - Health Protection Branch
HPPB - Health Promotions and Programs Branch
IDRC - International Development Research Centre
IIAB - Intergovernmental and International Affairs Branch
IOSSF - Intermittentently operated slow and filters
LCDC - Laboratory Centre for Disease Control
MBS - Market Basket Study
MCS - Multiple Chemical Sensitivities
MKO - Manitoba Keewatinowi Okimakanak
MOU - Memorandum of Understanding
MSB - Medical Services Branch
NAP - Northern and Arctic Pollution
NGO - Non Government Organization
NIHL - Noise-induced Hearing Loss
NTDs - Neural Tube Defects
NWT - Northwest Territories
PAHO - Pan American Health Organization
PCB - Policy and Consultation Branch
PCBs - Polychlorinated biphenyls
PCD - Pregnancy and Child Development
PSL - Priority Substances List
PY - Person Years
RC - Risk Communication
RCP - Reproductive Care Program
REACH - Restoring Environmental and Community Health
SIDS - Sudden Infant Death Syndrome
SLHEP - St. Lawrence Health Effects Program
SOP - Strategic Options Process
TCAC - Technical Committee on Arctic Contaminants
TCDD - a toxic dioxin
TDC - Tolerable Daily Concentration
TDI - Tolerable Daily Intake
THM - Trihalomethane
UQCN - Union québecoise pour la conservation de la nature
UV - Ultra-violet
WHO - World Health Organization
WHO-EURO - World Health Organization - Europe

Executive Summary

In March of 1992, the Minister of the former Health and Welfare Canada (now Health Canada) announced a 5-year (1991/92 - 1996/97) *Action Plan on Health and the Environment (APHE)* as part of the department's contribution to the Green Plan. The objectives of APHE were to:

- ***collect and provide information on; and,***
- ***establish standards for, and to give advice on the management of health risk to Canadians from their environment.*** [1]

APHE was intended to address problems that concern all Canadians by: regulating contaminants; monitoring environmental health issues; assessing the risks to the population as well as to specific groups; and, fostering individual, community and international initiatives. In addition, it was to focus on areas of Canada that are particularly vulnerable to pollution - the North and the Arctic - and other areas that have a long history of human and industrial activity such as the St. Lawrence River region and the Great Lakes basin. In addition, APHE was to direct its activities towards protecting groups of Canadians who are especially vulnerable to the effects of environmental contaminants.

As stated in the RFP, the overall objectives of this evaluation are as follows:

- to provide accountability to Parliament and the public on what was achieved with past expenditures under APHE; and,
- to identify "lessons learned" from APHE that might help Health Canada manage those activities and responsibilities that will remain after 1996-97, possibly under a new Health and the Environment program or as components of the Department's business lines. (Some of the lessons learned may also be more generally applicable to horizontal management in other areas.)

An evaluation of APHE represented a number of challenges and difficulties. APHE is an Action Plan that comprised 16 components at the outset. An evaluation of APHE should include an assessment of the Action Plan overall as well as the components of the Action Plan. Throughout this evaluation report we have tried to assess APHE at 2 levels - APHE overall from a holistic perspective, and the individual components of APHE.

A second challenge in the evaluation was determining criteria for evaluating APHE. Different evaluation criteria were applied to APHE overall in comparison to the individual APHE initiatives.

APHE Overall

- What did APHE achieve with respect to improving population health, and addressing public concerns about the environment and health?

APHE Initiatives

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[1] Action Plan on Health and the Environment (APHE) Program Evaluation Framework, Program Audit and Review Directorate, Health and Welfare Canada, March 31, 1993, p.4.

- To what extent have the component initiatives of APHE produced the anticipated results?

This study was carried out by Goss Gilroy Inc. at the request of the Health Canada, Evaluation Group, Strategic Planning and Review Directorate. It was completed between May and August 1996, and is based on information available at that time. The methodologies used included a document/file review, a Literature Review, a review of Omnibus Survey results, interviews, and internal and external discussion groups.

Description of APHE

The Action Plan on Health and the Environment is a package of sixteen Initiatives undertaken by Health Canada as part of the federal government's Green Plan. The original budget allocation for APHE was $175 million[2] over the period from FY1991-2 through FY1996-7. The funding for APHE only became available late in 1991-92. Although some planning took place in 1991-92, activity under most Initiatives did not begin until 1992-93 or later. The initiation of APHE took place during a period of considerable fiscal and organizational restructuring in the federal government.

To carry out these Initiatives, six Health Canada Branches were to work with other Federal Departments, other governments, and various groups and individuals. Some Initiatives consisted of new programming; while other Initiatives consisted of enhancements to existing Departmental programs.

The original 16 APHE Initiatives, were grouped under one of four Key Areas (Regulation and Monitoring, Groups at Risk, Facilitating Individual and Community Action, and International Liaison).

APHE was subsequently re-profiled and subject to 17 externally imposed funding reductions. The total budget was reduced to $127 million and two initiatives were dropped. Moreover, reorganization of Health Canada resulted in a merging of the six original branches responsible for APHE initiatives into five.

Summary of Conclusions

APHE Overall

- ***APHE was consistent with a growing need to address environmental health issues. Public concern about the negative impacts on health of the environment has increased.***

The Action Plan on Health and the Environment was created to respond to a growing sense of urgency felt in Canada and around the world with respect to environmental problems and their impacts on health.

The evaluation of APHE indicated that, from 1991 to 1995, the percentage of the public which perceived pollution to be an important cause of health problems increased from approximately 50 per cent to 60 per cent. APHE endeavoured to address this concern by increasing Health Canada's ability to regulate contaminants, monitor environmental health issues, assess the risks to all Canadians as well as to specific groups, and to foster individual, community and international initiatives. A review of the Environmental Monitor's survey results indicated that APHE has not yet affected the perceived level of concern by Canadians.

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[2] Health Canada planning documents.

In this regard, we concluded that APHE responded to a strong perceived need of the Canadian public for action on issues related to environment and health, however, the level of public anxiety with regard to these issues continues.

- ***APHE has resulted in a number of beneficial impacts on Health Canada.***

It is generally recognized that, prior to APHE, Health Canada lacked an integrated approach to linking social, environmental and economic issues that impinge on health. APHE represented a step forward in the department's ability to use a multi-disciplinary approach to attack environmental health issues. In essence, APHE helped Health Canada apply a holistic definition of health and well-being.

APHE led to improved interbranch understanding and collaboration. It also permitted the department to improve its infrastructure, programs and strategies to address environmental health issues. Finally, it increased the department's ability to work with communities and groups in improving their capacity to manage their environment and reduce environmental risks to health.

- ***There is little public knowledge of the existence of APHE or what has been accomplished through APHE.***

APHE commenced as the Health Canada portion of the Green Plan Initiative. From this perspective it fit into the Green Plan framework. Public opinion surveys in the past did not specifically address the level of knowledge of Canadians with respect to federal action on health and the environment. In 1996 Canadians were asked specific questions, for the first time, regarding Health Canada's initiatives under APHE. Only 5 per cent of respondents said that they had seen, read or heard of any Health Canada APHE publications or actions with respect to environmental health risks. However, at the level of individual initiatives, APHE managers did make efforts to communicate results.

We concluded that, despite efforts to promote APHE activities, public knowledge of APHE as a major Health Canada initiative was low.

- ***The objectives for APHE were very general and there were no specific criteria or indicators identified that would be suitable for evaluation. Therefore, it is very difficult to evaluate the impact that APHE had on population health.***

The APHE objectives, as well as the underlying objectives of the individual initiatives, are generally related to outputs rather than health outcomes. Therefore, it is not possible to quantitatively measure the contribution of APHE to an improved state of health in Canada, either now or in the future. To evaluate the success of APHE, it was necessary for the evaluation team to review the accomplishments of APHE in relation to the plans and targets created for each of the individual APHE initiatives. In other words, the evaluation of APHE overall is really a summation of the success of the parts. From this perspective, we found that the vast majority of initiatives accomplished a great deal. It is difficult to assess the accomplishments versus what was planned in 1992 because of the substantial cuts in funding that many of the initiatives suffered.

We concluded that much was accomplished under APHE; however, the accomplishments cannot be compared to quantitative benchmarks or objectives that are outcome oriented.

- ***APHE funding supplemented available A-base funding for many initiatives.***

We concluded that many of the activities carried out under APHE represent either expansion or a speeding up of ongoing Health Canada activities. We determined through interviews that some of APHE funding permitted Health Canada to carry out its mandate during a period of government-wide cutbacks and downsizing. This leads to two difficulties:

i) **Differentiating APHE activities from ongoing activities.** In many instances, it is difficult to determine the extent to which APHE contributed to additional activities over what the department would have done anyway (without budget cuts).

ii) **Dependency of sunsetting funds.** It is suspected by many Health Canada managers that ongoing departmental activities were funded by APHE while regular budgets were being cut. It may be difficult to replace this funding once APHE terminates.

We also concluded that some APHE funds were being used for activities that were not strictly related to environmental health.

- ***A number of APHE activities should be continued to ensure their sustainability and to preserve the APHE investment .***

An additional concern that arose is that of sustainability of many of the activities. In this report, we have identified a number of areas in which we believe a continuing Health Canada investment will be required to ensure that APHE investments are not wasted. Given the sunsetting provisions for APHE, as well as the underlying cuts in A-base funding, there is a danger that there will not be sufficient funding to maintain many of these initiatives. The following activities should be continued:

- those required under legislation (e.g. CEPA);
- partially completed research studies;
- periodic updating and maintenance of databases;
- environmental health programs directed towards Native people;
- dissemination of all APHE outputs (i.e. reports, studies, information); and,
- development of risk management strategies to complement the risk assessment work.

- ***There was a lack of a strategic plan for APHE.***

We concluded that APHE does not represent a well designed strategic initiative. Although a number of initiatives were identified along with goals, success indicators, and expected results, there was a lack of a documented plan that provided:

- a clear quantitative set of health objectives for APHE;
- delineation of the linkages between initiatives;
- a strategy for implementing change where necessary as a result of APHE findings; and,
- strategies for long term funding of activities initiated under APHE that would have to continue after APHE was sunsetted.

Another shortcoming of APHE was the failure to ensure that, where appropriate, risk assessment results would lead to concrete action at the community and political level to mitigate risks identified. This does not mean that the risk measurement activity is not important; however, explicit strategies must be established to ensure that action is taken to address environmental hazards to health.

- ***There was a lack of overall responsibility for APHE.***

We concluded that there was no overall responsibility for APHE at Health Canada; i.e., no one group within the department was responsible and accountable for the program. This resulted in a general inability to ensure that APHE issues were expeditiously and forcefully brought to senior management's attention.

We also concluded that there was a perception that there was insufficient senior management support of APHE in the department.

- ***The numerous funding cuts caused disruption in programming and planning.***

We concluded that the numerous funding cuts created many difficulties for managers in terms of preparing annual plans and establishing priorities. Managers were required to spend a lot of time re-adjusting their programs to constantly changing budgets. This created much uncertainty among program personnel.

- ***There was a general lack of formal coordination of APHE activities within Health Canada and with the Green Plan activities of other federal departments.***

We concluded that, although the APHE/Green Plan Implementation Committee provided an excellent venue for good informal communication/coordination between initiative managers and overall inter-branch communications, it was not used for substantive decision-making and hence, its mandate was limited. Further, as the Committee had no real authority over the branch representatives, many strategic issues related to community involvement never surfaced during committee meetings.

Overall, APHE was not perceived to be part of a coordinated government approach on the environment as there was little in the way of joint planning and collaboration at the beginning.

APHE Initiatives

- ***APHE has resulted in numerous achievements within individual initiatives.***

In our assessments of the success of individual initiatives, we concluded that:

Regulation and Monitoring

- The **Drinking Water Safety Initiative** has led to the development of scientifically defensible and economically integrated national guidelines, standards and regulatory measures, namely:

  - the proposed Drinking Water Materials Safety Act is set to be introduced to Parliament;
  - the Guidelines for Canadian Drinking Water Quality have been revised and published and include Guidelines for Radiological Characteristics in Drinking Water; and,
  - standards have been developed for addressing water treatment by-products.

- APHE funding supported/accelerated the conduct of activities in four main areas (i.e., regulatory, research, Section 17, and strategic options for risk management) within the framework of the **Canadian Environmental Protection Act**.

- The **Air Health Effects Program initiative** has resulted in the production of a significant amount of scientific data related to health impacts of air quality. Scientific and assessment information has been used to support the review and formulation of the air quality guidelines and the development of air quality management programs. This has resulted in more appropriate air quality standards for the protection of human health.

- Under the ionizing radiation component of the **Environmental Radiation and Radioactivity initiative** the FNERP has been revised; the National Calibration Reference Centres have been updated; the National Monitoring Network has been reviewed and some modernization has taken place with the purchase of more sensitive measuring equipment; and, a ground breaking study of the health impacts of uranium in drinking water has been completed.

- There is evidence to suggest that the **St. Lawrence Health Effects Program initiative** is addressing two important objectives; i.e., it is studying the relationship between the St. Lawrence and human health and it is assessing the risks of specific contamination.

- The asthma component of the **Environmental-Related Diseases Surveillance initiative** has been successful in contributing to:

  - the establishment of a solid infrastructure and network for continuing work in asthma surveillance and prevention and control;
  - a better understanding of the impact of asthma in Canada, asthma trends and risk factors;
  - the identification of high risk groups and areas of needed intervention;
  - the establishment of national asthma control goals and objectives; and,
  - identification of strategies to reduce asthma mortality and morbidity in Canada.

- The cancer component of the **Environment-Related Disease Surveillance initiative** has met its overall objectives of creating a national collaborative enhanced cancer surveillance system including:

  - development of a national environmental quality database;
  - creation of a national database of detailed cancer-risk factor information on over 20,000 recently-diagnosed cancer cases and 5,000 healthy Canadians;
  - creation of a sophisticated data linkage and analysis system for efficient evaluation of air and water quality cancer-environment risks; and,
  - risk management and communication of issues including ultraviolet light and chlorination by-products in drinking water.

- There has been extensive methods development through the activities of **Market Basket Survey initiative** More sensitivity was needed in order to detect small amounts of the compounds under study. Heightened sensitivity of detection enabled the Food Directorate to expand the scope of the Market Basket Survey in terms of the numbers and nature of the compounds studied.

Groups at Risk

- The **Drinking Water Safety Program for Native People initiative** is addressing its objectives; i.e., there is evidence that the initiative has contributed to: increased sampling and analysis of existing drinking water supplies for chemical and bacteriological quality; provision of advice to First Nations and DIAND on the design, maintenance and operation of community water systems; development of a training package for First Nations water treatment plant operators; and, promotion of the importance of having a potable water supply through various educational materials.

- The **EAGLE Project** has been successful in addressing its overall goal; i.e., the initiative has contributed to the blending of community and scientific knowledge in a partnership in its examination of the effects of contaminants on the health and well being of the Great Lakes Native populations. Considerable effort has been devoted to the communication of results in a manner which is deemed appropriate to all stakeholders. Extensive consultations have been held with participating communities and the coordination of study results is facilitated via regional representatives employed by the AFN. The EAGLE Project is considered to be an important model for community-based research in First Nation communities.

- As much work remains to be done, the LCDC component of the **Pregnancy and Child Development initiative** has not yet met its overall goal of providing a comprehensive program of enhanced surveillance and disease control for reproductive health as it relates to the physical and social environment. The CPSS database is not yet operational but the PEI Reproductive Child Care database is. Some success has been achieved within the individual activity areas.

- Overall, there is evidence that the **Northern and Arctic Pollution initiative** is addressing its overall goal of blending community and scientific knowledge in partnerships to examine the effects of contaminants on the health and well-being of the Northern First Nations populations. However, much of the work is in the analysis stage and the results will only be known in the long term.

  The initiative has contributed to the organization of meetings and the facilitation of dialogue on environmental health concerns in several Northern communities.

  Overall, the studies under this initiative have provided preliminary baseline data and identified the need for studying the effect of an "intervention" through monitoring.

Facilitating Individual and Community Action

- The **Healthy Environment Program initiative** activities have promoted the involvement of individual Canadians and communities in a healthy environment and have been instrumental in bringing together various groups in partnership to collaborate on issues that they share. The impacts of these activities are much longer term, therefore, it is too early to assess the extent to which the initiative has been successful in increasing awareness of environmental health issues and making it easier for Canadians to understand their own capacity to influence their health and the environment in which they live.

- The **Active Living Environments Program initiative** is addressing its goal; i.e., project activities have supported and encouraged Canadians to engage in more responsible, more active and healthier outdoor physical activities that are environmentally friendly and to enhance their collective capacity to preserve or create healthier environments for active living. In addition, ALEP is encouraging Canadians to address environmentally-based health risks like UV rays, recreational water and air pollution.

International Liaison

- The projects in the **International initiative** were completed as contracted and the overall goal of the initiative has been met; i.e., Canada became involved in international initiatives to reduce environmental risks to the health of Canadians (e.g., water filtration technology) and the citizens of other countries (Estonia, Latin America and the Caribbean).

Although there was an intention to provide information to the public to better inform them of health risks in their environment, most of the information generated to date has been directed to the scientific community through journal publications, scientific conferences and presentations. A notable exception has been the provision of information and results of studies directly to the First Nation communities.

Lessons Learned

The following describes the key lessons that have been learned as a result of the APHE experience. These lessons should be considered with regard to similar types of initiatives in the future.

- ***Lesson Learned: There is a need to develop a coherent strategy at the outset.***

For an action plan, such as APHE, to be effective, there should be a coherent planning structure with clear priorities and measurable objectives. This will permit a structuring of all of the components in a way that will facilitate achieving the key priorities and objectives. In the case of APHE, there is an implicit need to ensure that all projects and components have a clear link to health **and** environment. This would improve the ability of the Action Plan to meet tangible health outcome objectives.

- ***Lesson Learned: There is a need to ensure that future action plans have appropriate organizational structures and accountabilities.***

One of the difficulties of APHE has been the unclear accountability and responsibility for the overall action plan and for achievement of results. APHE consisted of a number of initiatives that were managed by individual areas of responsibility with no one accountable for APHE as a whole. This created problems in harmonizing components, selecting priorities, and allocating budgets in the most efficient manner.

Future action plans for horizontal multi-component undertakings should identify an organizational unit that is accountable for results. This will ensure:

- a clear definition of authority and responsibility;
- clear accountability for results;
- coherent and consistent management of budgets and expenditures, planning and reporting; and,
- improved coordination.

- ***Lesson Learned: There is a need to ensure linkage between risk assessment and risk management and communications.***

For an initiative such as APHE to provide health benefits, risk assessment must be completed and the information produced must be converted to action programs (risk management) and communicated to the target populations. These activities have to be explicitly planned and budgeted; otherwise there could be a tendency to focus only on the risk assessment activities, leaving little in the way of funding to develop and communicate risk management strategies for the risks identified during the assessment stage.

- ***Lessons learned: Resource management of long term initiatives in an unstable funding environment must be improved.***

Perhaps one of the most important and difficult lessons learned from APHE is the need to develop mechanisms that permit coherent resource management to support complex activities of a scientific nature in an unstable funding environment. There are a number of aspects to this problem:

- To carry out a well designed program in a scientific environment, it is necessary to stabilize the funding requirement. Since many scientific activities are of a long term nature, once a decision has been made on an activity, there is great inefficiency in cutting or reducing the funding prematurely. Therefore, once funding levels are established, they should be maintained unless the anticipated results of the activity do not materialize or the activity is no longer required. In addition to impairing efficiency, the cancellation of commitments leaves a negative impression among partners and co-delivery agents. This implies a need to reduce the committed expenditures to a level that can be definitely sustained and using any additional funds in a reserve capacity rather than creating a program that will not be financially sustainable; and,

- There is a need to ensure that consideration is given to the long term sustainability of scientific activities that are initiated with the use of sunsetting funds. This means that care should be taken to ensure that A-base funds will be available to support the project after funds have sunsetted.

- ***Lesson Learned: Five-year action plans are too short to achieve reasonable results in health and environment activities.***

Many of the activities undertaken under APHE require a lengthy set up time and often the programs are just really getting underway as the action plan terminates. For example, in the context of a 5-year action plan, it is difficult to achieve results in working together with communities in a collaborative process. The same situation often applies for research projects. These projects require extensive time for planning, staffing, purchasing of equipment and, in some cases, the development of methodologies to be employed. It is necessary to take this into account in developing projects for an action plan to ensure that projects are not terminated prematurely, thereby leading to a wastage of the investment.

The building of capacities within community-based organizations and/or other external stakeholder organizations is also a long-term investment that may span a period that exceeds the length of a 5-year plan.

- ***Lesson Learned: More comprehensive and consistent reporting of progress/results is required against plans and objectives.***

In order to properly evaluate the results and achievements of a major undertaking, such as APHE, it is necessary to have a clear, precise, comprehensive record of the original goals, objectives, achievements in relation to intended outcomes, and changes to these over time. If changes are not reported, it is difficult to evaluate such items as percent completed, value for money, and results achieved versus what was anticipated.

1.0 Introduction

1.1 Introduction

In March of 1992, the Minister of the former Health and Welfare Canada (now Health Canada) announced a 5-year $175 million (1991/92 - 1996/97) *Action Plan on Health and the Environment (APHE)* as part of the department's contribution to the Green Plan. The objectives of APHE were to:

- ***collect and provide information on; and,***
- ***establish standards for, and to give advice on the management of health risk to Canadians from their environment.*** [3]

With APHE, Health Canada was linking human health and the environment, or "putting health on the environment agenda" [4]. APHE was intended to address problems that concern all Canadians by: regulating contaminants; monitoring environmental health issues; assessing the risks to all Canadians as well as to specific groups; and, fostering individual, community and international initiatives. APHE was to focus on areas of Canada that are particularly vulnerable to pollution - the North and the Arctic - and other areas that have a long history of human and industrial activity such as the St. Lawrence River region and the Great Lakes basin. In addition, APHE was to direct its activities towards protecting groups of Canadians who are especially vulnerable to the effects of environmental contaminants.

As stated in the RFP, the overall objectives of this evaluation are as follows:

- to provide accountability to Parliament and the public on what was achieved with past expenditures under APHE; and,
- to identify "lessons learned" from APHE that might help Health Canada manage those activities and responsibilities that will remain after 1996-97, possibly under a new Health and the Environment program or as a component of the Department's business lines.

In addition, findings pertaining to the continued relevance and priority among activities and to the planning, coordination and administration of APHE across the Branches will be of particular interest to senior management.

An evaluation of APHE represented a number of challenges and difficulties. APHE is an Action Plan that comprised 16 components at the outset. An evaluation of APHE should include an assessment of the Action Plan overall as well as the components of the Action Plan. Throughout this evaluation report we have tried to assess APHE at 2 levels - APHE overall from a holistic perspective, and the individual components of APHE. Many of the lessons learned will also have broader relevance to horizontal management in general. In addition, APHE represented a challenge in terms of assessing whether APHE provided value-for-money and/or "value added" over and above the sum of what the individual initiatives contributed.

A second challenge in the evaluation was determining criteria for evaluating APHE. We are of the opinion that there are different evaluation criteria that must be applied to APHE overall in comparison to the individual APHE initiatives:

APHE Overall

- What did APHE achieve with respect to improving population health, and addressing public concerns about the environment and health?

APHE Initiatives

- To what extent have the component initiatives of APHE produced the anticipated results?

To assess the above, we had to refer back to the plans and objectives that were created at the outset of APHE in 1992. This posed a significant difficulty. First, the underlying environment has been very unstable. Budgets have been cut and the planning documents produced at the outset were not updated in a way that would permit the evaluation team to track exactly what activities have been dropped and which ones have remained. During the five years there have also been some changes in priority and structure for the initiatives due to the budget cuts and the changing priorities. The evaluation team, therefore, relied heavily on the extent to which objectives produced at the outset were met as a key criteria of accomplishment, along with the opinions of outside stakeholders and technical specialists as to the quality, usefulness and appropriateness of the outputs of APHE.

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[3] Action Plan on Health and the Environment (APHE) Program Evaluation Framework, Program Audit and Review Directorate, Health and Welfare Canada, March 31, 1993, p.4.

[4] Ibid, p.3.

In a later section of this report we refer to the fact that APHE as a whole failed to establish objective health outcome indicators as targets. This fact made it impossible to evaluate overall whether APHE had any impact on the health of Canadians due to reduced environmental risks. Of course this type of impact will take years to establish, but the failure to quantify targets reinforces the contention by many that APHE primarily supplemented and reinforced what the department was already doing.

This study was carried out by Goss Gilroy Inc. at the request of the Health Canada, Evaluation Group, Strategic Planning and Review Directorate. The study was completed between May and August 1996, and is based on information available at that time.

The report is structured as follows:

- **Section 1.0** introduces the report and describes the methodologies employed during the study;
- **Section 2.0** contains the historical background and overall description of APHE;
- **Section 3.0** contains our findings on to overall APHE management issues;
- **Section 4.0** contains our findings on the success of APHE initiatives as well as our findings on public opinion trends vis-à-vis health;
- **Section 5.0** contains our findings with respect to the continued relevance of APHE activities; and,
- **Section 6.0** summarizes our conclusions for APHE as a whole and presents the lessons learned for the future;
- **Appendix A** contains the list of interviewees and discussion group participants; and,
- **Appendix B** contains profiles of APHE initiatives.

1.2 Evaluation Methodology

The evaluation study used several lines of evidence such as document/file review, a Literature Review, a review of Omnibus Survey results, interviews, and discussion groups. The various methodologies employed during the study are as follows:

Interviews with Initiative Managers

All initiative managers were interviewed. This resulted in 33 Initiative/sub-initiative manager interviews.

File and Document Review

The evaluation team reviewed all available and pertinent public opinion surveys contained in Government of Canada and Health Canada publications (*Focus Canada*, *Environmental Monitor,* and the *Reid Report*). Public opinion information was available from the *Environmental Monitor* for 1992 to 1996. In addition, 5 omnibus questions were submitted to the June 1996 issue of the *Environmental Monitor*. The results of the June issue survey were included in our analysis.

We also reviewed the available literature to identify similar programming approaches in other countries with respect to health and the environment; perceived regulatory and environmental monitoring gaps in Canada and elsewhere; the main perceived environmentally-induced risks to health; and, lessons learned in Canada or elsewhere with respect to effective environmental health programs.

We also reviewed departmental reports on expenditures for APHE overall, and for each of the initiative areas.

Finally, we reviewed the 1992 APHE planning documentation submitted to Treasury Board, annual plans and reports produced for all APHE Initiatives. This included a statement of objectives for each initiative, a list of accomplishments for the past year, projects funded, and planned activities for the next year.

Project files, project progress reports, evaluations and special studies, etc. were also reviewed. Results were incorporated into a database on program accomplishments and results.

In all cases we conducted follow-up interviews with stakeholders to confirm results and to validate reports of initiative activity.

Interviews with other Federal Government Personnel

We conducted interviews with two groups of federal government officials in Ottawa and in the Regions. The first group of interviewees included ADMs and Directors with responsibility for APHE initiatives.

The second group of contacts were other federal stakeholders such as Environment Canada personnel. The majority of these interviews were conducted over the telephone.

A total of 26 interviews were completed (9 with senior Health Canada officials and 17 with other federal stakeholders).

Interviews with Other Stakeholder Groups (Non-federal government personnel)

We also interviewed other stakeholder groups that were familiar with APHE initiatives as either co-delivery agents, users, clients, or as target groups. These included provincial government personnel, spokespersons for environmental organizations, representatives of associations (e.g., Canadian Mining Association), representatives of Aboriginal organizations, and representatives of communities.

A total of 73 interviews were conducted.

A list of interviewees is contained in Appendix A of this report.

Discussion Groups

We held four discussion groups with internal Health Canada personnel as well as with external stakeholders and experts to provide additional input on the effectiveness of APHE delivery and the appropriateness and usefulness of APHE outputs from a client perspective.

- **Internal discussion groups**

These groups focused on the internal administrative issues related to APHE; e.g., what worked and what didn't work.

We held 2 discussion groups of two hours each; one group consisted of the APHE/Green Plan Implementation Committee members and one group consisted of senior Health Canada (non-Committee members) managers. The recruiting of participants for these discussion groups was managed by Health Canada.

- **External Stakeholder Discussion Groups**

We held two meetings of two hours each in Ottawa. One group was made up of First Nation stakeholders and one group was made up of a discussion group comprised of external technical experts.

A summary of discussion group attendance is presented below:

Discussion Group	Number of Participants*
Senior Health Canada Management	7
Members of APHE Implementation Committee	13
Technical Experts	5
First Nations	2

* does not include Evaluation Team observers

1.2.2 Constraints to the Evaluation

There were a number of constraints that affected this evaluation.

- Implementation of a number of the APHE initiatives were delayed and hence are not as yet completed. This did not permit us to determine the success of some initiatives.

- Re-profiling and funding cuts occurred throughout APHE. This caused a number of problems for evaluating APHE:
    - specific goals and objectives established for initiatives changed over time; hence making it very difficult to develop reference points for measuring success; and,
    - a number of areas were dropped or cut.
- the original planning documentation and budgets were altered a number of times during the course of APHE. Therefore, we had difficulty finding a consistent set of objectives and indicators that could be used to determine success. Furthermore, where objectives/indicators exist, they are often so general that assessing whether they have been met is difficult.
- There were difficulties in accessing both the information and stakeholders needed to provide the required inputs on results actually achieved. Given the relatively tight time frame, timing (a large number of people were on summer vacation), and budget for the evaluation we had to use documentation as much as possible, as well as extensive use of telephone interviews.
- Demonstrating long-term impacts on health requires the use of epidemiological databases. Such impacts will take years to show up in the epidemiology data, especially in a statistically reliable way.
- Another constraint which confronted the evaluation team was the co-mingling of new APHE funds with ongoing O&M funding or other Green Plan funds. For example, APHE funds for the Northern and Arctic Pollution Initiative were mingled with the Department of Indian Affairs and Northern Development's (DIAND) Arctic Environment Strategy (Green Plan) funds. This made it difficult for stakeholders to differentiate the source of funds and the results that are attributable to the funding sources.

It should be noted that this report is not meant to be an APHE Annual Report. Initiatives are described in terms of their highlights and for more details on their activities, the reader should consult the APHE/Green Plan Annual Reports.

2.0 Background

2.1 Overview of APHE

2.1.1 Historical Perspective

There is a growing sense of urgency felt around the world as we are faced with environmental problems of global scale. Numerous conferences, round tables, reports and policy papers have addressed the issue of global environmental threats, their causes and what actions are required to address these threats. The following summary outlines just some of the main conferences and reports which have set the stage for current policies and programs in Canada which aim at enabling individuals and communities to make the link between human health and the environment and to take steps to help manage the risks coming from environmental sources:

- in 1986, the World Health Organization (WHO), Health Canada and the Canadian Public Health Association (CPHA) held a major conference that resulted in the *Charter for Health Promotion* which recognized the impact of physical and social environments on human health;
- Health Canada's report, *Achieving Health for All: A Framework for Health Promotion*, (1986) is reported to be one of the first documents to solidify the link between healthy people and healthy environments. This report reflects a new vision of health as a "resource which gives people the ability to manage and even to change their surroundings", and recognizes the potential citizens have to create healthy communities;
- the vision articulated in *Achieving Health for All Report* (1986) led to the Healthy Communities Project which aims at enhancing quality of life by encouraging municipalities and communities to make health a primary factor in political, social, and economic decision making;
- the *Report of the World Commission on the Environment and Development* (1987) highlighted the now widely-adopted concept of sustainable development; i.e., "development that meets the needs of the present without compromising the ability of future generations to meet their needs";
- an assessment of public reaction to the Federal Government's December 1990 announcement of the *Green Plan* indicated public concern over the Green Plan's initial focus on the environment. Recommendations arising from these public consultations resulted in a Green Plan which included a strong concern for human health and environmental protection - of the almost 4,500 [5] recommendations on all aspects of the Canadian environment, forty-two (42%) per cent were health-related;
- the National Round Table on the Environment and the Economy produced a document entitled *Reporting on Sustainable Development* (December 1993) which argues for the development of a system to report on the progress made toward sustainable development. The proposed reporting system would look into the health of the ecosystem, assess the interaction between people and the ecosystem, assess the well-being of people, and look at the links between them. Resulting information would be made accessible to all stakeholders and be linked to decision-making so that action can be taken before a crisis arises;
- the Canadian Council of Ministers of the Environment has been promoting a conceptual framework which defines ecosystem health as a "state in which the environment is viable, liveable and sustainable, the economy is equitable, sustainable and adequately prosperous, and the community is liveable, equitable and convivial" in *A Framework for Developing Goals, Objectives and Indicators for Ecosystem Health: Tools for Ecosystem-Based Management*, November 1994; and,
- a Guide to Green Government, adopted in 1995 by all Ministers, is a framework which seeks to integrate sustainable development into the workings of the federal government by helping all departments develop their own comprehensive, results-oriented sustainable development strategies. The guide helps departments identify their sustainable development objectives and develop action plans to achieve them. Ministers will be expected to report on their sustainable development efforts by 1997. The Auditor General's Act was recently amended to require departments to report on their sustainable development strategies. A new environment commissioner was appointed in July 1996.

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[5] A Vital Link, Health and the Environment in Canada, Health and Welfare Canada, 1992, p.133.

These documents collectively emphasize the linkages between human health and the environment, the critical roles stakeholders (including communities and government) must play in order to preserve healthy environments; the emphasis on sustainable development; and, the inherent link between economy, community and environment.

2.2 Description of APHE

2.2.1 Description of APHE

The Action Plan on Health and the Environment is a package of sixteen Initiatives undertaken by Health Canada (HC) as part of the federal government's Green Plan. The objectives of the Initiatives are to collect and provide information on, to establish standards and regulations for, and to give advice on the management of health risks to Canadians from their environment.

The original budget allocation for APHE was $175 million [6], spread over the period from Fiscal Year (FY) 1991-2 through 1996-7. Though planning and initial funding began in FY1991-2, actions under most Initiatives did not begin until FY1992-3 or later. Most APHE projects did not get underway until 1992/93 because the funding only arrived in the third quarter of 1991/92.

To carry out these Initiatives, six Health Canada Branches [7] (CSB, HPB, HPPB, MSB, IIAB, PCB) were to work with other Federal Departments, other governments, and various groups and individuals. Some Initiatives consisted of new programming; other Initiatives consisted of enhancements to existing Departmental programs.

APHE funding was the subject of repeated re-profiling and reductions throughout the summer of 1992. The financial history of APHE is described in Section 3.0.

The original 16 APHE Initiatives, were grouped under one of the following four Key Areas. Subsequent budget cuts and re-programming altered the initiatives slightly but in essence the 4 key areas have been maintained. The description of each Initiative identifies the Health Canada Branch responsible and the original funding and person-years over the period 1992-97.

Regulation and monitoring:

Eight of the APHE Initiatives were to strengthen regulatory standards in Federal jurisdiction and the Department's monitoring and assessment of health risks in the environment. All eight Initiatives under this Key Area were the responsibility of Health Protection Branch. Initiatives in this Key Area had an initial total budget of $72.35 million. This represented about 41.3% of the funding for all APHE Initiatives.

Groups at Risk:

Environmental problems pose greater health risks for some Canadians than for others. The groups at risk identified under APHE were Aboriginal Canadians, Northern residents, pregnant women, mothers, and children. The protection of these groups at risk is the purpose of four APHE Initiatives with a combined original budget of $60.65 million. This represented 35% of total APHE funding.

Facilitating Individual and Community Action:

In 1990 national consultations revealed strong support for focusing research priorities and data gathering to local communities and their specific problems. APHE included measures to provide scientific information to individuals and groups, to help create a positive climate for change in communities, and to provide opportunities for Canadians to act together. The three Initiatives in this Key Results Area had a combined original budget of $39.6 million. This represented 23% of APHE funding.

International Activities:

This Initiative had an original budget of $0.5 million which represented about 0.3% of APHE funding. Intergovernmental and International Affairs Directorate (IAD) used this budget to support Health Canada's involvement in international initiatives to reduce environmental risks to the health of Canadians and the citizens of other countries. This funding was mainly used for grants in support of the WHO Environmental Health

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[6] Health Canada planning documents.

[7] The six Health Canada Branches were reduced to five (CSB, HPB, HPPB, MSB, PCB) in a 1993 reorganization.

Program and the Pan-American Health Organization (PAHO) Environmental Program. Funding was also used to support Canada's participation in such activities as the International Initiative on the Protection of the Arctic Environment.

A detailed profile of each of the APHE initiatives is contained in Appendix B.

Table 1 below summarizes the sixteen Initiatives at the outset of APHE and includes the original budget, person-years, branch responsibility, links to other departments, governments, etc., and objectives. Except as otherwise noted, the Initiatives received significant portions of their funding and started operation in FY1992-93.

Table 1: Summary of APHE Initiatives

Initiative	Original Budget/PYs	Branch Responsible for Administration	Objectives/Description
Regulation and Monitoring: 1. Drinking Water Safety Initiative (DWSI)	$15.03 million (14 PYs)	Health Protection Branch (HPB)	to legislate drinking water quality in the federal domain and establish standards for materials and chemicals used in water, and for water treatment devices
2. Canadian Environmental Protection Act (CEPA)	$9.9 million (10 PYs)	Health Protection Branch	to conduct health assessments of 44 top-priority substances (there are currently 23,000 chemicals in commercial use in Canada)
3. Air Health Effects Program (AHEP)	$12.85 million (11 PYs)	Health Protection Branch	to perform research and assessments on the health risk posed by airborne pollution in Canada
4. Environmental Radiation and Radioactivity (ERR)	$7.44 million (4 PYs) (no significant funding until 1993-94 due to reprofiling)	Health Protection Branch	to assess and manage cancer risks and psychological stress of sources of ionizing and non-ionizing radiation on the health and well being of the public and occupationally exposed workers and to improve the government's prepaparedness and response to nuclear emergencies
5. St. Lawrence Health Effects Program (SLHEP)	$5.2 million (2 PYs) (no significant funding until FY93-94 due to reprofiling)	Health Protection Branch	to investigate the levels of contaminants in communities and to help reduce environmental risks to the health of inhabitants of this region

Initiative	Original Budget/PYs	Branch Responsible for Administration	Objectives/Description
6. Environment-Related Disease Surveillance (ERDS)	$15.0 million (6 PYs)	Health Protection Branch	to provide essential information to identify potential cancer risks related to environmental contaminant hotspots and evaluate specific environmental concerns to provide relevant surveillance and risk assessment information to enable effective prevention and control of asthma in Canada
7. Market Basket Survey (MBS)	$5.0 million (8 PYs)	Health Protection Branch	to conduct "market basket" or "total diet" surveys across the country to assess human exposure to contaminants in food
(Formerly #8) Waste Management Initiative (WMI) **Note: This initiative was eliminated 2 months after Treasury Board approved the funding for APHE.**	$1.93 million (2 PYs)	Health Protection Branch	estimate and assess the risks to health associated with waste disposal practices. Prevents or control the risks to health from waste disposal practices by promoting the development of appropirate and effective practices and strategies. Develop in the public an awareness and understanding of the health risks associated with waste management.
Groups at Risk: 8. Drinking Water Safety Program for Native People (DWSPNP)	$25.0 million (37 PYs)	Medical Services Branch	to develop solutions with regard to water quality problems in partnership with First Nations' people
9. Effects on Aboriginals from the Great Lakes Environment - Project EAGLE	$6.95 million (5 PYs)	run in partnership between Medical Services Branch and Assembly of First Nations	community-based study which takes a holistic approach to assessing the effects of contaminants, direct and indirect, on the health and well being of First Nations residents on the Great Lakes Basin.

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Initiative	Original Budget/PYs	Branch Responsible for Administration	Objectives/Description
10. Pregnancy and Child (PCD) Development	$10.0 million (6 PYs) $6.40 million	Health Protection Branch Medical Services Branch (Native communities)	focuses on health and environmental issues related to productive health and child development
11. Northern and Arctic Pollution (NAP)	$6.80 million (4 PYs) - HPB $5.5 million (5 PYs) - Medical Services Branch (MSB)	Health Protection Branch and Medical Services Branch	to assess the health risks and the specific concerns of northern communities
Facilitating Individual and Community Action: 12. Healthy Environment Program (HEP)	$22.70 million (3 PYs)	Health Promotion and Programs Branch	to help Canadians to clarify and consolidate their understanding of the interaction between health and the environment and to take productive action, both individually and collectively
13. Risk Communication (RC)	$5.0 million (8 PYs) (due to reprofiling, did not start until FY94-95)	Health Protection Branch (no funding until FY1994-95 due to reprofiling)	to establish a national network of core communication groups, participate in public informs, lead or coordinate health investigations to assess risks of environmental diseases
14. Active Living Environments Program (ALEP)	$11.90 million (3PYs)	Fitness Canada	to build a national consensus around the outdoor Active Living environments; to initiate a series o Active Living experiences related to the environment; to ensure environments in which Canadians may safely participate in physical activity; and, to promote alternative modes of transportation that are less environmentally harmful
International Liaison: 15. International	$0.5 million	Policy and Consultation Branch	to support Health Canada's involvement in international initiatives to reduce environmental risks to the health of Canadians and the citizens of other countries

Initiative	Original Budget/PYs	Branch Responsible for Administration	Objectives/Description
Management and Administration	$1.90 million (2 PYs)	Departmental Executive & Corporate Services Branch	to provide central administrative services

Source: Evaluation Framework, March 31, 1993, Health Canada, Program Evaluation Division.

2.2.2 New Directions at Health Canada

Since the initiation of APHE, the federal government has been restructuring its processes from an activity-based planning system to a business planning system. Health Canada's Business Plan for 1996/97 to 1997/98 [8] reflects this new approach for government and is proceeding under a new departmental business planning system. One of the new proposed business lines, the Population Health Strategy Business Line, is intended to include a number of the aspects of APHE in one business area. Its broad integrated approach to the determinants of health represents a new direction for the Department in that physical and social environmental factors such as social status, income, working conditions, health behaviours, childhood development and health services will also be taken into consideration when determining health. Further, strategies will be based on an assessment of risk and benefit that may apply across the entire population or to particular sub-groups of the population.

Within the Population Health Strategy, there are plans underway to create a new Health and Environment Strategy [9] which will continue to focus on health and the environment past 1997. Program strategy and funding allocation will be developed within a broad approach involving many partnerships and levels of government. Both Health Protection Branch (HPB) and Health Promotion and Programs Branch (HPPB) will have lead roles in the Health and Environment Strategy. This Strategy will focus on four key activities - control of toxic substances, bioregional health effects, disease surveillance, and community action and social marketing - with HPB primarily responsible for the first three and HPPB primarily responsible for the last activity.

Finally, MSB has A-based (Indian Health Envelope) its activities under DWSPNP, EAGLE, and NAP (methylmercury work initiated under PCD was subsumed under NAP) to ensure their continuation.

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[8] *Getting From Here to There*, Draft, May 14, 1996.

[9] *A Population Health Strategy for Health and the Environment in HPPB*, Draft 2, March 11, 1996.

3.0 Management of APHE

APHE consisted of a special allocation to Health Canada to fund a comprehensive action plan within the framework of the Federal Government's Green Plan. Because of the range of activities undertaken and the complexity of getting such a program underway quickly, a number of issues emerged. In this section of the report we discuss the major findings of the evaluation that pertain to the management of APHE. In doing so, we address the following evaluation questions:

Q16. How have the repeated reprofiling and reductions of funding affected the Department's ability to meet the commitments given in APHE announcement? Have there been other significant impediments to the Department's meeting its commitments?

Q17. What have been the mechanisms for coordinating APHE actions within the Department and with actions of other Green Plan departments? Have these mechanisms been effective and efficient? If not, how should coordination be improved?

We have organized the chapter as follows:

Section 3.1 covers the strategic management aspects of APHE;

Section 3.2 discusses the financial cutbacks and reprofiling impacts on APHE;

Section 3.3 discusses the coordination issues surrounding APHE; and,

Section 3.4 discusses the positive impacts of APHE on the department.

3.1 Strategic Management Issues

A program such as APHE is very complex . To ensure that: the Action Plan is well-focused; results are measurable; activities will lead to concrete benefits to Canadians in terms of improvements in their health and/or sense of well being; and, there is clear accountability, the evaluation team was of the opinion that the priorities and objectives for an action plan should encompass the following attributes:

- a clear definition of the domain of intervention. This means that clear criteria should be established to determine what are acceptable initiatives and projects that fall into the domain of environmental health. As is noted earlier, the definition of "environment" is extremely broad, and can be defined as the social environment, the community, and the ecosystem. The domain of intervention must be refined so that objectives are achievable and measurable;
- recognition of the domains of competence within each level of government and the assurance of coordination. As in any other initiative, development of risk management strategies must consider activities that will be undertaken by the provinces and/or lower levels of government. Planning for an initiative such as APHE requires adequate coordination with all levels of government;

- an appropriate balance between effort allocated to determining the problem (e.g. assessment), development strategies to manage the problem, and communications with the target populations. In this sense, initiatives under an Action Plan such as APHE must be balanced so that information that is obtained through assessments can be used to reduce risks to population health, and subsequently, so that communications and other activities can be undertaken to provide action to reduce the risk in a tangible way.

  Therefore, planning for an Action Plan should explicitly consider sustainability and implementation strategies that will ensure risk areas are properly addressed through action plans; and,

- an appropriate balance between issues. Clearly there are trade-offs to be made among problem areas; e.g. the health impacts of air quality, water quality, contaminants in the food chain, etc. Choices must be made as to where to allocate dollars to arrive at the highest return.

The following were considered to be the major issues with respect to the strategic management of APHE:

- the strategic plan for APHE;
- implementation of the strategy;
- APHE as a funding source;
- overall responsibility for APHE;
- senior management support; and,
- other management effectiveness issues.

3.1.1 The Strategic Plan for APHE

It is generally recognized by Health Canada managers that, prior to APHE, there was no integrated approach to linking the social, economic and environmental activities that impinge on human well being. But, it is also recognized that APHE did contribute to linking activities related to health and the environment. In this sense APHE was a good first step in providing a multi-disciplinary approach for a concerted effort to address environmental health issues. Nevertheless, some interviewees indicated that (and the evaluators concurred through their own analysis) that APHE does not represent a well designed strategic initiative. Moreover, a senior Health Canada manager commented that APHE was not part of a well coordinated effort on the part of the federal government despite the existence of the Green Plan. Although a number of initiatives were identified along with goals, success indicators, and expected results, the evaluation team's opinion was supported by some of the interviewees in its observation that there was a lack of a documented plan that provided:

- a clear quantitative set of health outcome objectives for APHE;
- delineation of the linkages between initiatives;
- a strategy for implementing change where necessary as a result of APHE findings; and,
- strategies for long term funding of activities initiated under APHE that would have to continue after APHE was sunsetted.

From this perspective, APHE was characterised by some of the interviewees as a "basket of different initiatives that were combined together to form an action plan". Others felt that APHE was more of a "funding mechanism than a strategy". There was no clear complementarity or explicit thematic focus.

Given the generalized objectives of many of the initiatives and the lack of global outcome objectives, it is very difficult to assess the success of the overall APHE program. In a sense APHE was a convenient way of funding a number of activities that Health Canada must do to carry out its mandate. In addition, it allowed Health Canada to supplement some of these activities for a period of time with APHE funds.

Another aspect of APHE is the fact that, in the opinion of the technical advisors to the evaluation team, not all of the activities were clearly linked to environmental health. Rather they were "packaged" to fit APHE funding requirements. For example:

- the Environment-Related Disease Surveillance activities pertaining to asthma were considered to be primarily disease surveillance activities;
- a number of the Pregnancy and Child Development studies are primarily health surveillance related; and,
- the activities of the Active Living Environment Program (ALEP) are considered to be only partially related to the environmental health area.

In summary, some of the activities undertaken under APHE are substantially health activities with a small environment component. The implications are that Health Canada did not entirely conform to the mandate provided by the federal government in its planning documentation.

3.1.2 Implementation of the Strategy

Another shortcoming of APHE, as identified by the evaluation team, a few Health Canada managers and the Technical Discussion Group, was a failure to ensure that risk assessment stage results led to concrete action at the community and political level to mitigate risks identified. This does not mean that the risk measurement activity is not important; however, once risks have been identified explicit strategies must be established to ensure that action is taken to address environmental hazards to health. For example, members of the Technical Discussion Group felt that too much time is being devoted to risk assessments in comparison to developing and implementing strategies for risk management (i.e., action-oriented programming). Although it is understood that surveillance is needed to understand population health problems, it is critical to ensure that this leads to risk management strategies being implemented which will have an impact on future health expenditures.

Members of the Technical Discussion Group felt that Health Canada has not demonstrated sufficient benefits from many of its environmental health activities to defend itself against any future cuts in programming.

Further comments by the evaluation team's technical specialists supported this view:

- Projects reviewed are somewhat haphazard in their planning. Risk assessments are not integrated with options for a risk management strategy and communications strategy. It appears that insufficient budget and planning has been devoted to the longer term risk management requirements.
- Although risk assessment activities (a primary role for Health Canada) are well defined and implemented, risk management activities have not been well planned and are uneven. The

limited role of Health Canada in risk management must be taken into account as the provinces are often involved in the risk management aspects.

3.1.3 APHE as a Funding Source

Another strategic management issue is the dependency created by sunset programs. Clearly APHE has provided needed resources to Health Canada during a period of continuing government cutbacks. The difficulty that this poses is that the department becomes dependent on special funding allocations such as APHE to continue many necessary activities. At the onset of APHE, there were insufficient funds to undertake many of the activities that Health Canada needed to do in order fulfill its mandate. For example, without APHE funding:

- CEPA would not have met its legislative mandate within the required time frame;
- the Federal Nuclear Emergency Response Plan would not have been revised; and,
- many ongoing health initiatives (improved training of drinking water system operators on reserves) would not have been completed or possibly started.

In addition, a number of long term activities were initiated under APHE which will require continued funding in order to provide a return on investment. For example:

- ongoing maintenance of databases established under APHE;
- the study of the impacts of pesticides on farm families; and,
- the environmental-related disease surveillance systems.

These will create a problem as the funding resources run out and APHE activities remain ongoing.

The evaluation team had difficulty determining precisely what additional A-Base funding was provided by APHE over what should have been funded under normal A-base budgets. This was confirmed by some senior management in the department. It also poses the difficulty of dependency, where a portion of a department's activities are being funded by short-term resources. This is especially critical in areas which require long-term surveillance and/or continued research to provide results.

Although APHE, as will be demonstrated later in this report, has provided a number of very useful products, a failure to continue funding activities could undermine the investments made by APHE.

An additional and related problem is staffing. Some departmental managers indicated that, although they initially staffed APHE activities with term and contract positions, this did not work well. Ultimately the department hired full-time resources using APHE funds. This could create a potential personnel problem after the termination of APHE as the underlying salary dollars will run out and there may not be funds available to maintain the staff complement. This also threatens the gains made through APHE initiatives and the sustainability of projects.

3.1.4 Overall Responsibility for APHE

Interviews with Health Canada APHE managers indicated that other than the role played by the APHE/Green Plan Implementation Committee there was no single senior management authority consistently responsible and accountable for the program. This resulted in a general inability to ensure that APHE issues were expeditiously and forcefully brought to senior management's attention.

3.1.5 Senior Management Support

An issue which arose during discussion groups and interviews with Health Canada managers relates to the perception by some managers that there was insufficient senior management support of APHE in the department. Factors contributing to this perception include the following:

- There was insufficient senior management representation on the APHE Implementation Committee, although this was seen to be the key implementation and coordination committee for the program; and,
- Persistent cutting of APHE funds, often without overt senior management involvement (e.g., unclear processes and criteria for priorizing cuts), gave rise to the perception that some of APHE activities were not deemed to be important enough to support.

This was considered to have been the source of morale problems, and also may have undermined the priority given to the planning and implementation of APHE in the department.

3.1.6 Other Management Effectiveness Issues

Finally, results of the discussion groups and interviews with Health Canada managers indicated a number of additional impediments to effective management of APHE. The extent to which these affected management effectiveness varied from initiative to initiative. These included:

- insufficient time at the outset of APHE to hire staff. This made it difficult for some initiatives to start the work right away;
- Administrative requirements for APHE required a lot of management's time;
- Reliance on contract and term staff was problematic in that some of these individuals left for permanent positions. This caused some disruption of APHE activities as new individuals were brought up to speed;
- The time period needed to establish a system, producing and verifying results and proposing regulatory measures and criteria is longer than the APHE timeframe; and,
- It takes time to build up trust in communities and this resulted in a slow start in field work for APHE activities involving First Nations (DWSPNP, Northern and Arctic Pollution, and EAGLE). Demands have now increased to the point where they exceed available resources.

One of the direct impacts of these impediments is a general impression that APHE is behind schedule and has accomplished less than was planned. The underlying budgetary problems and the changing objectives and initiatives makes it difficult to verify what impact these factors presented.

3.2 APHE Financial Management

> ***Q16.*** ***How have the repeated reprofiling and reductions of funding affected the Department's ability to meet the commitments given in APHE announcement? Have there been other significant impediments to the Department's meeting its commitments?***

3.2.1 Impact of Repeated Reprofiling and Reductions of Funding

APHE was initially intended to start FY1991-92; however, Treasury Board did not approve of the funding until January 20, 1992 - in the last three months of the fiscal year. Shortly afterwards, Treasury Board announced a government-wide spending freeze. This event, along with late funding approval, resulted in a serious disruption of the planning and implementation of a number of APHE activities. In addition, Green Plan Ministers set up a Green Plan contingency reserve of about 10 per cent of Green Plan funds for new programming. The reserve was established from existing allocations over the next six years, with departmental contributions to the reserve starting in FY1991-92. The following was the chain of events:

1. January 20, 1992 Treasury Board approval of $175 million for APHE [10];
2. First contribution to the Green Plan contingency reserve of $5 million (all from HPB);
3. "Voluntary Reprofiling" of resources from 1991-92 to 1993-94 and 1994-95: $2.565 million (HPB, MSB, IIA) from 1991-92; 55 per cent or $1.41 million approved for reprofiling to 1993-94 and 1994-95 at 50 per cent each year (i.e., $0.706 million for 1993-94 and $0.705 million for 1994-95);
4. 1992 budget reprofiling of $4.7 million from 1992-93 and $4.8 million from 1993-94 to 1994-95, 1995-96 and 1996-97 (MSB, HSP, HPB, FAS);
5. Communication expenditure cut (from 1992 budget) of $26 thousand per year beginning 1992-93;
6. Second contribution to the Green Plan contingency reserve of $3.5 million [11];
7. 1992-93 forced lapse of $400 thousand(of this, $337.5 thousand was used as a credit against the government-wide 1992-93 reduction in O&M of 2 per cent);
8. Ten (10%) per cent reduction to the Green Plan funds: $3.209 million in 1993-94 and $4.068 million in 1994-95;
9. Third contribution to the Green Plan contingency reserve of $3.288 million from 1993-94;
10. Fourth contribution to the Green Plan contingency reserve of $2.962 million from 1994-95;
11. Fifteen (15%) per cent and 20 per cent reduction of Green Plan funds (1993 budget): $5.856 million from 1995-96 and $8.317 million from 1996-97;
12. Treasury Board approval of $10 million from 1993-94 to 1997-98 (SLAP II);
13. Treasury Board approval/extension of $3.601 million from 1994-95 to 1996-97 for EARP resources;
14. Treasury Board approval/extension $10.473 million from 1994-95 to 1996-97 for Health Canada Pesticide Review resources;
15. Program Review I reductions of $3.61 million from 1995-96 and $9.832 million from 1996-97;
16. Transfer into Health Canada of Green Plan resources from Agriculture Canada, Environment Canada and Natural Resources Canada of $7.275 million in 1995-96 and

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[10] Health Canada planning documents.

[11] The 45% or $1.154 million contributed at step 3 above is part of the $3.5 million, leaving $2.346 million to contribute.

$8.499 million in 1996-97 for consolidation of the Pest Management Regulatory Agency (PMRA); and,

17. Reprofiling of $3.0 million from 1995-96 and $5.0 million from 1996-97 for sunsetting strategies.

Also, some initiatives were further affected by the introduction of new activites at the sub-initiative level (e.g., asthma component of ERDS). The impact of sub-dividing initiatives had the effect of diverting some of the funds to the new activities.

It should be noted that the initial allocation of $175.0 million has been reduced to approximately $126.8 million to date, representing a 27.5 per cent reduction.

The extent of the budget impacts varied from initiative to initiative. For example, the budget for DWSI was reduced by 31.5 per cent, the budget for EAGLE was reduced by 39.1 per cent, the budget for PCD was reduced by almost 61 per cent, while the budget for Risk Communications was reduced by 100 per cent.

The following observations emerged from interviews with Health Canada managers:

- APHE started out as Health Canada's Green Plan program. However, once launched, Treasury Board added additional programs under the Green Plan such as Acid Rain. Therefore, Health Canada had a mixture of items that included APHE and Green Plan funded initiatives.
- Some interviewees indicated that there is a perception within Health Canada that the cuts to APHE illustrated a gradual backing away from the federal commitment to health and the environment.
- APHE originally responded to public pressure on environmental issues.

In addition, discussion group results and interviews with initiative managers and, in some cases, other stakeholders, indicated that the reprofiling and reductions in funding resulted in the following negative effects.

Disruption in Programming and Planning

Results of the Senior Health Canada Management discussion group indicated that, without exception, the funding cuts created a lot of difficulties for most managers in terms of preparing annual plans and establishing priorities. They were required to spend a lot of time re-adjusting their programs to constantly changing budgets. Further, in order to compensate for APHE cuts, some managers devoted A-base resources to support APHE initiatives; however, this had a negative impact on other activities funded in A-base budgets.

Reduction in the Number of Activities that Could Be Undertaken and Loss of Health Canada's Credibility

Initially there was a pro rata approach to the cuts. However, results of the discussion groups with Senior Health Canada Managers and APHE/Green Plan Implementation Committee members indicated that the number and the extent of funding cuts reached a point where whole areas of intervention (i.e., Acid Rain) and two initiatives had to be dropped (Waste Management and Risk Communication). In addition, some initiative managers had difficulty fulfilling initial commitments to stakeholders. Cancellation of commitments created a negative impression that affected Health Canada's credibility with its outside stakeholders, particularly the First Nation groups whose skepticism of federal government intentions was only reinforced by the cuts and reprofiling of APHE funding.

Results of interviews with Health Canada initiative managers indicated that many of the initiatives suffered in terms of reductions/cancellations in the activities initially planned as a result of the reprofiling and cutbacks. For example:

- under the Drinking Water Safety Initiative (DWSI), the investigation of contaminants in the soil and the development of soil guidelines were cancelled;
- under the Canadian Environmental Assessment Act (CEPA) initiative, the amount of research done was reduced which, in turn, likely affected the completeness of the assessment work done;
- the Air Health Effects Program (AHEP) abandoned correlated areas of research; i.e., air toxics, climate/weather and health, indoor air issues, reduced their research work with universities and dropped investigations into carbon monoxide, hydrogen fluoride and sulphur dioxide;
- under the Asthma component of the Environment-Related Diseases Surveillance (ERDS) initiative, some activities were postponed or reduced in scope and two seminars were cancelled;
- under the Cancer component of ERDS, the scope of activity planned was severely curtailed; particularly in the areas of risk assessment, risk management and communications. In addition, no return was realizable from resources invested in feasibility/planning studies as there was no longer funds available to proceed on to the main study (e.g., the Agricultural Cohort Study and the Miron Quarry Risk Assessment);
- more communities could have been reached under the Drinking Water Safety Program for Native Peoples (DWSPNP) initiative;
- under the Pregnancy and Child Development (PCD) initiative:
    - a multi-year Birth Defects and Environmental Exposure Study was cancelled;
    - the National Birth Outcomes Linkage Study was halted and rolled into the Canadian Perinatal Surveillance System study; and,
    - the scope of the Farm Family Health Study was reduced from a national study to an Ontario study.
- under the Healthy Environment Program (HEP) initiative, the number of Grants and Contributions projects were reduced; and,
- under the Active Living Environments Program (ALEP), there was a reduction in the number and scope of national projects.

In the opinion of some stakeholders, the inability to fulfil commitments to client groups hurt both the credibility of Health Canada and that of the stakeholder organizations (e.g., provincial government ministry, community group, NGO). Further, stakeholder groups are also affected in that they themselves are unable to plan and budget activities that were to be supported by APHE funds. This was particularly problematic for the Health Promotion and Program Branch's initiatives - HEP and ALEP.

Adverse Effects on Internal Relationships

Interviews with senior Health Canada managers and results of the discussion group with APHE/Green Plan Implementation Committee members indicated that the cuts negatively impacted on working relationships within the department by creating animosity between branches; i.e., led to "turf wars" as to where cuts should be made.

Impacts on Personnel

The most obvious impact was the loss of staff. The hidden impact was the negative effect on staff morale of the cuts. The uncertainty and ongoing tension created about cuts and cancellations created a strain on project managers and professional staff which filtered throughout project teams.

Interviews with outside stakeholders indicated that loss of staff affected the continuity of activities and made it difficult in some cases to obtain information.

3.3 Coordination of APHE Actions Within Health Canada and With Actions of Other Green Plan Departments

Q17. What have been the mechanisms for coordinating APHE actions within the Department and with actions of other Green Plan departments? Have these mechanisms been effective and efficient? If not, how should coordination be improved?

3.3.1 Description of Coordination Mechanisms

In an Action Plan such as APHE, the coordination function is important because of the need for complementarity of activities and the potential for overlap.

Initially, formal coordination of APHE activities within Health Canada was to be through a policy group which reported to their respective Assistant Deputy Ministers (ADMs); however, the ADMs met only once. Thus, for the first two years of APHE, the various branches involved in APHE activities acted more or less on their own with little in the way of inter-branch communication. However, it became clear to initiative managers that some coordination was needed and in the third year of APHE, the APHE/Green Plan Implementation Committee (APHE/GPIC) was struck. This committee was comprised primarily of initiative managers. In general senior Health Canada managers did not actively participate. In addition, an APHE Secretariat was set up; however, it did not have any dedicated resources.

The APHE/GP Implementation Committee was to:

- "coordinate the projects being undertaken by the six (now merged into five) branches within Health Canada;
- convene regular meetings of project managers to update the status of each project and to discuss matters that may affect the projects;
- identify overlaps between projects to avoid duplication and identify opportunities for collaborative efforts;

- keep branches financially accountable for project expenditures and inform project managers on the latest changes to resource levels;
- identify communication opportunities for the Minister and Deputy Minister and help open lines of communications between programs and branches;
- ensure that messages presented to the public and other clients are accurate and consistent with departmental policy;
- act as the "one stop shopping" source of information related to groups such as: Program Audit and Evaluation, Treasury Board, Green Plan Office, Privy Council Office, Auditor General's Office, and other departments and agencies; and,
- the chair and the secretariat functions of the committee will rotate to a different branch or directorate every two years."[12]

Overall coordination between Health Canada's APHE activities and Green Plan activities of other departments was done through interdepartmental committees (e.g., Ad Hoc Federal Committee on Nuclear Emergency Preparedness, Federal/Provincial Drinking Water Sub-committee) and working groups (e.g., CEPA Working Group, project-specific working groups within the PCD initiative) which met regularly or as the need arose. In addition, in a number of initiatives, coordination of activities was ensured through multi-departmental (and sometimes other government) advisory committees (e.g., the Advisory Committee to the EAGLE initiative involving Fisheries and Oceans Canada, Environment Canada and the Ontario Ministry of Environment and Energy, the Arctic Environmental Strategy Science Managers Committee involving Health Canada, the Department of Indian Affairs and Northern Development, and Fisheries and Oceans Canada).

Coordination of activities within initiatives was mainly through management groups, working groups, project advisory committees, correspondence and personal communication. For example, stakeholders in the PCD initiative participated on Expert Panels and/or sat on the Project Advisory/Steering Committees.

3.3.2 General Comments on Effectiveness and Efficiency of the Coordination of APHE

Results of the discussion groups and interviews provided a number of comments pertaining to the coordination aspect of APHE:

Coordination of APHE Activities Within Health Canada

APHE/Green Plan Implementation Committee

- APHE/GPIC provided an excellent venue for good informal communication/coordination between initiative managers and for good overall inter-branch communications.
- Working relationships, and thus coordination, between branches improved over time. Health Canada Interviewees generally felt that, within their respective initiatives, coordination of project activities was good.
- APHE/GPIC, due to the nature of its membership, was not used for substantive decision-making and hence, its mandate was limited.

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[12] APHE/GPIC Terms of Reference

- APHE/GPIC had no real authority over the branch representatives which made it difficult to vet branch problems at the committee level. Hence, many strategic issues (e.g., issues related to community involvement) never surfaced during committee meetings.
- There was not always full branch participation at committee meetings and there were numerous instances in which personnel was substituted.

As a result of the above, the APHE/Green Plan Implementation Committee had no power to ensure: coordination of all activities; adjustment of priorities; and, most effective use of funds. Furthermore, there was no other body doing this.

APHE Secretariat

- As there were no dedicated resources for the Secretariat, annual reporting was mixed in terms of quality and completeness.

Overall Coordination of APHE Activities and Green Plan Activities of Other Departments

- Little documentary evidence was obtained regarding formal overall coordination of APHE/Green Plan activities among departments. Some interviewees felt that APHE was not perceived to be part of a coordinated government approach on the environment as there was little in the way of joint planning and collaboration at the beginning. In addition, some interviewees felt that there were no ongoing mechanisms in place for coordination.
- Stakeholder perceptions as to the effectiveness of interdepartmental coordination varied from initiative to initiative. For example, interviewees indicated that the coordination between Health Canada and Environment Canada appears to have worked better for the HEP initiative than for the CEPA initiative. (This refers to the PSL I process only. In response to this, coordination was improved for the PSL II process.)
- There was a lack of awareness on the part of some stakeholders as to what were the mechanisms for interdepartmental coordination. This made it difficult for them to obtain information about what people were doing and how priorities were being set.

3.3.3 How Coordination Could be Improved

Interviewees and discussion group members felt that coordination was not very effective during APHE. In interviews with senior Health Canada officials, a number of suggestions were put forward as to how to improve coordination for an APHE-like initiative in the future. These included:

- creation of a central fund for APHE initiatives managed by a Secretariat. This would:
  - have the advantage of ensuring that proposals for funding would be vetted in a consistent manner against established criteria;
  - ensure that priorities are developed and that activities are ranked according to these priorities; and,
  - ensure APHE initiatives conform to a strategic direction.
- creation of a permanent Senior Management Policy Committee for Environment and Health which would help provide a strategic framework to an overall program.

3.4 Positive Impacts of APHE on Health Canada

It was generally recognized by Health Canada managers that, prior to APHE, Health Canada lacked an integrated approach to linking social, environmental and economic issues that impinge on health.

APHE represented a step forward in the department's ability to use a multi-disciplinary approach to attack environmental health issues. In essence, APHE helped Health Canada apply a holistic definition of health and well-being.

The discussion groups and Health Canada interviewees reported that, in spite of the aforementioned problems, there were a number of benefits to the department in that APHE contributed to:

- bringing branches together to work on a common problem;
- reducing the "stovepipe" mentality within the department, thereby reducing overlaps, duplication, etc.;
- improving interbranch understanding and collaboration;
- allowing personnel to become increasingly aware of what others in the department are doing;
- increasing the department's understanding of the environment as a determinant of health and, in fact, expanding the definition of what constitutes the environment;
- permitting the department to improve its infrastructure, programs and strategies to attack environmental health issues;
- leading to improved partnerships with provincial governments, First Nations, and other federal departments;
- leading to the creation of databases which will be used in disease surveillance;
- improving the department's ability to identify high risk populations;
- augmenting the department's scientific research activity over what would have been done under the A-base budget; and,
- improving the department's ability to work with communities and groups in improving their capacity to manage their environment and reduce environmental risks to health.

4.0 Success of the Initiatives

The following section provides an overview of the main accomplishments and relative success of the fourteen [13] initiatives supported under APHE. In addition, the evaluation team's assessment of each of the initiatives is provided. The evaluation of individual initiatives was based on our file/document review information, interviews with Health Canada managers, and, most importantly, interviews with external clients and stakeholders.

The basis for our evaluation was a comparison between the goals established for each initiative and the accomplishments. We also took into account the viewpoints of stakeholders and technical advisors to the evaluation team.

There were a number of difficulties encountered by the study team in completing the evaluation of individual initiatives:

- the original planning documentation and budgets were altered a number of times during the course of APHE, therefore, we had difficulty finding a consistent set of objectives and indicators that could be used to determine success. Furthermore, where objectives/indicators exist, they are often so general that assessing whether they have been met is difficult;
- reporting of APHE accomplishments was inconsistent from one initiative to another. This is true with respect to the quantity and quality of the reporting;
- over the course of APHE, the content of the initiatives changed from year to year; and,
- the work done in a number of APHE initiatives was clearly A-base, therefore, indicators and objectives parallelled the normal operating objectives/indicators of the branch. This made it difficult to determine what incremental effect APHE had over what Health Canada would have done otherwise.

We have organized this chapter as follows:

Section 4.1 discusses the seven initiatives grouped under Regulation and Monitoring;

Section 4.2 discusses the four initiatives grouped under Groups at Risk;

Section 4.3 discusses the two initiatives grouped under Facilitating Individual and Community Action;

Section 4.4 discusses the one International Liaison initiative; and,

Section 4.5 discusses the impact of public communication.

4.1 Regulation and Monitoring

There are seven initiatives involved in regulation and monitoring under APHE. These are:

- Drinking Water Safety;
- Canadian Environmental Protection Act;
- Air Health Effects Program;
- Environmental Radiation and Radioactivity;

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[13] Due to reprofiling and funding cuts, two initiatives (Waste Management and Risk Communication) were cancelled.

- St. Lawrence Health Effects Program;
- Environmental-Related Disease Surveillance; and,
- Market Basket Survey.

The section below addresses the following evaluation issues:

Q.1 ***What standards, regulations, and criteria have been proposed as a result of work done under the Initiatives? Have these been adopted? Why or why not?***

Q.3 ***What new and existing investigation and monitoring programs has funding under APHE supported? How have the results of these programs been used in managing health risks to Canadians from their environment?***

Q.4 ***Have the results of and advice arising from risk assessments, investigations and monitoring been communicated as intended, i.e., to the appropriate recipients and within time periods required or promised? How has the advice been used in managing health risks to Canadians from their environment?***

Q.5 ***Which data bases and information sources have been established or enhanced under the Initiatives? Who are the primary users of these data bases and information sources? How extensive is the use of these data bases and information sources, by whom, and for what purposes?***

Q.6 ***Scientific research and methods development sponsored under APHE.***

a. What projects have been funded? What were the results or products of the projects?

b. Have the projects been for a clearly defined clientele? Did the clients get the results? Did the clients find the results useful?

Q.12 ***For SLHEP, what has been the Department's success in developing partnerships with Aboriginal Canadians, with professional organizations, with voluntary health and social groups, and with the private sector, to increase individual and community action on health, environment and sustainable development issues?***

a. How many communities participated in the activities of the Initiative?

b. How many communities succeeded in meeting objectives they had set for themselves with the Initiative? What actions were taken by these communities on health, environmental or sustainable development issues, and what were results of these actions?

In its planning documents, Health Canada asserted that the regulation and monitoring initiatives under APHE will ensure Canadian's basic protection from environmental risks by setting standards for air, soil water and food quality. The information provided would facilitate decision-making on control options and serve as a foundation from which other jurisdictions could set in motion further action protecting human health.

Sections 4.1.1 through 4.1.7 below summarize the specific results achieved by each of the seven initiatives as well as the study team's assessment of each initiative's success in meeting its goals/objectives under APHE. More details on these initiatives are provided in Appendix B.

4.1.1 Drinking Water Safety Initiative (DWSI)

Goals/Objectives

The overall goal of this initiative was to safeguard the drinking water of Canadians and reduce exposure to environmental contaminants through drinking water by the development of scientifically defensible and economically integrated national guidelines, standards and regulatory measures. Forty projects were initiated in eleven major target areas: risk assessment is addressed by three target areas while eight target areas address the risk management aspect.

Accomplishments

As a result of the work done under this initiative, the following has occurred:

- The Guidelines for Canadian Drinking Water Quality were updated and revised in cooperation with the Federal/Provincial Sub-committee on Drinking Water. This culminated in the production of the 6th edition of the Guidelines. These guidelines are used by the provinces and territories and reflect possible health risks including disinfection by-products such as trihalomethanes (THMs), aluminum, fluoride, usage of pesticides and other chemicals.

  In addition, a national inventory of radiation measurement capabilities has been completed and Guidelines for Radiological Characteristics in Drinking Water have been approved and published in the above mentioned 6th edition of the Guidelines for Canadian Drinking Water Quality.

- A memorandum to Cabinet was prepared and submitted for the proposed Drinking Water Materials Safety Act (DWMSA) which would require certification against health based standards for drinking water materials. In addition, the initiative provided support to legislators during the various drafts of the proposed legislation.

  The DWMSA has received Cabinet approval and is to be introduced to Parliament shortly.

- Initiative activity has resulted in over 50 publications, 30 presentations, and 15 product/device evaluations.

In addition, Health Canada personnel have: provided health advisories to communities; responded to requests from the provinces for support during emergency situations (e.g., risk assessments); and, provided interpretations and advice in response to technical queries.

Scientific publications are the main vehicle for information dissemination but there is also good supporting documentation for each guideline. These are intended for academics and various experts.

Assessment of the Initiative's Success

The Drinking Water Safety initiative has basically met its overall intended objective; i.e., to develop scientifically defensible and economically integrated national guidelines, standards and regulatory measures:

- the proposed Drinking Water Materials Safety Act is set to be introduced to Parliament;
- the Guidelines for Canadian Drinking Water Quality have been revised and published and include Guidelines for Radiological Characteristics in Drinking Water; and,
- standards have been developed for addressing water treatment by-products.

The DWMSA is expected to have a positive impact on the Canadian population as a whole as the Act will curtail the existence in the marketplace of substandard water supplies as a result of inferior water treatment equipment and infrastructures.

The process involved in revising the Guidelines for Canadian Drinking Water Quality was considered by both Health Canada and stakeholder interviewees as an excellent example of federal/provincial cooperation on public health matters. In their opinion, the public consultation process was a good one in that it was visible and there was every attempt made to justify the rationale for revising guidelines. Further, the scientific rigour and leadership role of Health Canada in carrying out the various risk assessment studies was viewed as a major strength by stakeholders.

The major benefit of the initiative according to stakeholder interviewees will be increased public confidence in public drinking water systems. In fact, there is evidence that there has been a significant shift in the disinfection process used by industrial water treatment operators to reduce the production of trihalomethanes (THMs), a disinfection by-product.

Interviewees also indicated a small number of weaknesses associated with the above activities. These include:

- Water quality is primarily an area of provincial jurisdiction and the guidelines do not have the force of law; and,
- The DWMSA covers only devices/additives and home components and does not regulate water quality.

Concern was expressed related to the lack of Industry Canada's involvement as this department is responsible for developing policy in the area of standards development.

4.1.2 Canadian Environment Protection Act (CEPA)

Objectives/Goals

The overall goal of the CEPA is to identify, assess and manage the health risks of priority substances under the Canadian Environmental Protection Act (CEPA).

Under CEPA, the Ministers of the Environment and of Health must assess whether substances on the Priority Substances List (PSL) are "toxic" (as defined under CEPA) within 5 years of their being placed on the list.

Following on the successful completion of assessments on 44 substances on the first PSL (PSL I) within the legislated deadline of 11 February 1994, the second CEPA Priority Substances List (PSL II) comprising discrete substances as well as releases and emissions, was published in the Canada Gazette Part I on 16 December 1995. Health Canada also shares with Environment Canada responsibility for developing measures to control the release of "toxic" substances to the environment. A consultative approach (Strategic Options Process or SOP) for developing options for managing releases of "toxic" substances has been put into place and will continue in the current fiscal year. New information necessary for carrying out assessments of, and developing control options for, priority substances will be generated by conducting a number of projects in accordance with Section 15 of CEPA.

Accomplishments

APHE funding supported/accelerated the conduct of activities in four main areas within the framework of CEPA. The major accomplishments of these areas are as follows:

1. Regulatory

   APHE funding enabled the 44 substances on the Priority Substance List I (PSLI) to be assessed by the legislated deadline of February 11, 1994. Of these, 18 were determined to be "toxic" with respect to health (APHE aspect) as defined by paragraph 11 (c) of the CEPA - *"constituting or that may constitute a danger in Canada to human life or health"*, 13 were assessed as nontoxic, for 8 there was insufficient data for a conclusion, and for the remaining 5, no assessment was conducted (already covered under other regulations, insufficient information to estimate the exposure of humans, did not apply for human populations).

A list of 25 substances for PSL II has been prepared. The preparation of this list involved extensive consultations with the Minister's experts and the review of some 600 substances. Assessment work on these began in December of 1995.

2. Section 17

Under Section 17 (S.17) of CEPA , Environment Canada forwards all information it has collected concerning potential adverse health affects to Health Canada for assessment. Health Canada's evaluation work on these submissions helped eliminate the backlog of S.17 submissions - of over 500 S.17 submissions that were submitted, 445 were evaluated and advice was provided to Environment Canada on the hazard associated with most of them. A draft document that contains guidance on what information should be provided was completed and distributed.

3. Strategic Options for Risk Management

As noted above, Health Canada shares responsibility with Environment Canada for assessing the need to control substances deemed to be "toxic" as defined by Paragraph 11 of CEPA, and to develop appropriate control strategies. APHE funding enabled EHD to initiate the development of principles for managing the health risks of "toxic" substances and participate in the Strategic Options Process (Risk Management) developed by Environment Canada. Currently draft reports detailing strategic options for managing the health risks of three substances deemed "toxic" are waiting ministerial review: PERC (chemical used in drycleaning), Benzidine/dichlorobenzidine, and Ceramic Fibres.

4. Research

A number of studies are being conducted on priority list substances to fill data gaps in the toxicology data base. Results of research identified to date include:

- development of a technical proposal for the use of biomarkers as indicators by which the effectiveness of proposed control measures for various toxic substances under CEPA may be assessed;
- assessment of multi-tissue exposure to priority substances by using a multiplex of biomarkers assembled as a single molecular toxicity assay;
- screening of priority environmental contaminants for potential effects on the human endocrine and reproductive functions and characterization of the endocrine and reproductive toxicity of selected priority substances using *in vivo* methods; and,
- determination of the subchronic oral toxicity of three PSL II substances in the rat and validation of two non-invasive biomarkers.

Fifteen (15) publications and meeting presentations have emanated from CEPA-APHE research (1991-1996) activities to date.

In addition, there were a number of key outputs produced under APHE:

- 44 assessment reports on the PSL I substances have been published and distributed;

- *Human Health Risk Assessment for Priority Substances*, CEPA, Health Canada: provides an approach to human health risk assessments for Priority Substances under paragraph 11 (c) of CEPA;
- *Guiding Principles for the Risk Management of Toxic Substances*, June 1995: intended to enable the Bureau of Chemical Hazards to define appropriate strategies for the risk management of individual toxic substances;
- Guidance Values (Tolerable Daily Intakes or TDIs for water, soil, Tolerable Daily Concentrations or TDCs for air, carcinogen) for all PSL I are about to be published. The ultimate client for these are the regulatory agencies within all levels of government as well as for other countries; and,
- Public information material (pamphlets, fact sheets, etc.) was developed and distributed to all media and made available through Health Canada's publications office upon request. In addition, some were distributed to target audiences directly; e.g., *Your Baby's Health and the Environment* was distributed to all new mothers in hospitals.

Assessment of the Initiative's Success

As the activities carried out under CEPA are part of Health Canada's legislated mandate, APHE funding was an add-on contribution to A-base operational budgets. Thus, APHE funding generally enhanced/accelerated CEPA activities that would have gone on under A-base but at a slower pace. Thus, it is difficult to assess what incremental impact APHE had over what Health Canada would have done anyway. However, that being said, an assessment can be made of what happened during the five years of APHE support.

In the opinion of Health Canada interviewees, the key benefit of the PSL I assessment process has been the improvement of the knowledge base on target substances so that scientifically defensible assessments can be made. This was supported by stakeholders who felt that this has led to policy initiatives. Some evidence has been provided to indicate that this has happened:

- Regulations have been adopted for dioxins and furans (pulpmill effluent);
- There has been an Amendment to the Fisheries and Oceans Act with regard to pulpmill effluent;
- There is a Memorandum of Understanding (MOU) with the dyestuffs industry (Chemical Producers Association) to use "cleaner" chloranil in their product (i.e., this would limit the dioxin content);
- Bis (2-Chloromethyl) Ether (BCME) has been regulated as a result of its assessment; and,
- Chloromethyl Methyl Ether (CMME) has been regulated as a result of its assessment.

Interviews with stakeholders indicated that the PSL I process was flawed. They felt that more effort could have been devoted to risk management under this initiative. In their opinion, the PSL I process was a restrictive process in that it only involved scientists. Since it did not include those involved in risk management, the process resulted in a substance being declared toxic **without** the vital information needed (e.g., extent of exposure, sources of release, pathway) to manage its risk. For example, benzene was declared "toxic". The two main sources of this toxin are fuel and natural gas dehydration. These dehydrators are only located in Western Canada in unpopulated areas where human exposure is nil. Thus, in their opinion, there is little value added to regulating a substance for which there is no risk. A risk management strategy requires a better assessment of the risk and there is a belief that this was not done under PSL I.

Another problem identified is typical of two departments working together. Although Health Canada and Environment Canada are both responsible for CEPA, they each have their own priorities and there was a perception from the point of view of some outside stakeholders that these two departments lacked a team approach.

The overall perception of interviewees is that results have been well received by the scientific community. For example, 35 manuscripts of PSL I health risk assessments were published in the Journal of Environmental Science and Health (Special Issue, Volume 12, Number 2, 1994). In addition, the assessment format (shortened version) has been adopted by the International Program on Chemical Safety (World Health Organization) and there is evidence that it is being used by other countries.

On the other hand, although copies of the individual assessment reports are available upon request, there have not been many requests for copies.

4.1.3 Air Health Effects Program (AHEP)

Goals/Objectives

This program focused on assessing risks posed by acid rain, airborne particles, ground level ozone and other air pollutants by:

i) identifying the hazards and assessing exposure associated with airborne contaminants;

ii) estimating the risks to human health;

iii) participating in the mitigation of risks to human health; and,

iv) communicating human health risks to the public.

Thirty-eight projects, encompassing laboratory investigations, exposure assessments, epidemiological studies and national surveys, were initiated under this initiative.

Accomplishments

As a result of the activities of this initiative, the following has been accomplished:

- Guidelines for air quality, the National Air Quality Objectives, have been developed. In addition, relevant tools for assessing the risks to human health of factors affecting the quality of air have been developed;
- APHE supported the development of important research methods. In particular:
  - In the **toxicological studies** area:
    - methods and techniques were developed to examine the short and longer term effects of exposure of animals to combinations of pollutants;
    - new biological endpoints of adverse effects (ie. localized lung damage and remodelling) were identified and quantified; and,
    - an "in-vitro" laboratory was established to examine possible adverse effects using techniques that reduced the use of costly and complicated animal studies.
  - In the **population studies area**:

  - new physical and chemical methods were developed to measure specific air pollutants; e.g., acid aerosols, volatile organic compounds, particulate matter, etc.; and,
  - a collaborative inter-departmental research program was sustained which permitted direct and ongoing information exchange between experts in atmospheric chemistry (Environment Canada) and environmental health researchers.
- New guidelines for particulate matter have been developed;
- Community-based health indicators of air quality, based on community consultations (questionnaires, focus groups and workshops), have been developed;
- The results of the epidemiological studies conducted on ozone and particles have produced articles in scientific peer reviewed journals;
- A working group report on the effects of ground level ozone has been produced; and,
- A total of 121 reports have been produced since the AHEP began in 1992.

Assessment of the Initiative's Success

The AHEP initiative has resulted in the production of a significant amount of scientific data related to health impacts of air quality. Although a number of research studies have not yet been completed, the information produced to date has been particularly useful to the scientific community.

Health Canada interviewees indicated that the scientific and assessment information produced has been used to support the review and formulation of the air quality guidelines and the development of air quality management programs. This evidence, along with other scientific evidence has been used in the ongoing review of current ambient guidelines and in the development of "air pollution public health advisories" which have recently been implemented in Canada. Further, results of research activity indicates that there are adverse effects of air pollution exposures at concentrations previously assumed to have no effect. The information produced has also been used in the international negotiations between Canada and the United States on air quality.

The results of the research projects are being used to address gaps in information required for the risk assessment process. The science performed under this initiative is considered to be very strong and Health Canada is in the process of developing more sensitive methods of determining health effects related to air quality.

In addition, as a result of carrying out the initiative activities, Health Canada's technical expertise has been significantly enhanced. This has resulted in an active exchange of information with universities and other organizations.

Although there have been a large number of reports published under this initiative in scientific journals, there has not been much in the way of communication and dissemination of results to the public.

4.1.4 Environmental Radiation and Radioactivity (ERR)

Goals/Objectives

The overall goal of this initiative was to address some of the fears about risks to health that Canadians feel towards developments such as nuclear reactors and electric power lines, towards environmental factors such as noise and solar UV, and concerns they have working with radioactivity. The initiative activities were designed to allow Health Canada to:

- determine the effects of these developments and factors on the health and well being of Canadians;
- improve response to nuclear emergencies;
- respond to public concern; and,
- manage health risks.

There were two main areas of activity:

1. Environmental Radioactivity or Ionizing Radiation

There were four areas of activity:

i) National Calibration Reference Centres

The specific goal of this area was to upgrade the National Calibration Reference Centres in order to: accurately measure internal contamination in women; ensure that Canadian facilities can accurately measure exposures below the new, lower dose limits soon to be imposed by the Atomic Energy Control Board (AECB); and, be able to offer new bioassay intercomparison programs needed by occupationally exposed workers.

ii) Chronic Uranium Uptake

The goal of this activity area was to assess the uptake of uranium under chronic ingestion conditions and evaluate the usefulness of biological indicators of kidney damage.

iii) National Radioactivity Monitoring Network

This area's specific goal was to implement recommendations for revitalizing and restructuring the National Radioactivity Monitoring Network and improving the laboratory treatment of samples.

iv) Revision of the Federal Nuclear Emergency Response Plan (FNERP)

The specific goal was to completely revise the Federal Nuclear Emergency Response Plan (FNERP), which had not been revised since 1984, in order to: ensure coordination of all federal resources; effectively interface these resources with Provincial plans; and, integrate international assistance.

2. Environmental Radiation or Non-ionizing Radiation

In general, the studies in this area involved identification of the hazard and then assessing the risk.

There were three areas of study:

i) Solar UV (Electro-Optics)

The intended goals of this study area were to produce public information on health risks from solar UV radiation in cooperation with Health Promotion, Active Living, LCDC and Reader's Digest and to develop an assay to measure an individual's sensitivity to exposure and the damage to a particular person.

ii) Electromagnetics

The specific goals of this study area were to: assess the effects of electromagnetic fields (EMF) through research (both in-house and outside contracts), review current knowledge, and, collaborate with other international organizations on the World Health Organization's Electric and Magnetic Field Project.

iii) *Acoustics (environmental noise from aircraft)*

This study area's specific goal was to assess the risk of stress-related disease from environmental aircraft noise generated by low level training flights and the take-offs and landings of commercial/civilian jets.

Accomplishments

According to interviewees, the major accomplishments of this initiative to date include:

Ionizing Radiation

- **Updating of National Calibration Reference Centres:** There has been significant revision of the National Calibration Reference Centres. The equipment bought with APHE funds has helped place Canada in the top ten laboratories in the world involved in this type of work.
- **Chronic Uranium Uptake:** An important study on uranium in drinking water has just been completed. This is an area in which there was previously very limited human data. The results are in the process of being analysed and there are no conclusions formulated to date. However, the results will be used to help those involved in setting the guidelines for uranium in drinking water.
- **National Monitoring Network:** Significant steps in modernizing the National Monitoring Network have been made under APHE. Equipment was bought and a major report, *Review of the National Radioactivity Monitoring Network and Reactor Monitor Network (July 1995)*, has been produced. The latter will serve as a "working blueprint" for future direction.

  In addition, ground work for establishing a shared, nation-wide Environmental Radiological Database was begun. This database will serve as a central repository of the environmental radiological data collected by all Canadian jurisdictions and international agencies.
- **Revision of the Federal Nuclear Emergency Response Plan (FNERP)**: Various sections, appendices, and annexes of the revised FNERP have been completed and circulated, and a full draft is due for release in October 1996. The revised plan clarifies the roles and responsibilities in the event of a nuclear emergency (the last one was too vague); in particular, it clarifies federal-provincial interaction which did not exist in the previous plan.

  A Memorandum of Understanding between Canada and the United States and a Joint Radiological Emergency Response Plan have been completed and signed on July 27th, 1996.

  Health Canada has participated in departmental, inter-departmental and international committee meetings on emergency preparedness, completed two projects to coordinate Health Protection Branch's involvement in major or catastrophic emergencies, and conducted a preliminary assessment of the geographic information management needs of the FNERP.

  In addition, a national inventory of radiation measurement capabilities has been completed and Guidelines for Radiological Characteristics in Drinking Water have been approved.

Non-ionizing Radiation

In general, the results of the research studies done to date indicate that more work is needed. However, a number of accomplishments were cited by interviewees:

- **Solar UV:** APHE funds supported the production and distribution of public information pamphlets and HPB Issues papers on the health risks of exposure to solar UV: the re-publication of the pamphlet *"The Sun, Your Baby and You"*; production of an HPB *Issues* on sunglasses; production of a poster of Reducing Health Risks from UV Radiation; production of *"Enjoying the Sun Safely"*, an 8-page insert in the June 1995 issue of Reader's Digest; and, production of the Canada Safety Council's *"Canada Sun Guide"*. In addition, a working group was organized in cooperation with the Canadian Standards Agency (CSA) to propose standards for the labelling of sunglasses. This resulted in the publication of standard CSA-CAN Z-94.3 1995 by CSA in August 1995.

  The communication of scientific information with regard to the health effects related to UV radiation was largely supported under the Healthy Environment Program initiative.

- **Electromagnetic Fields:** A number of abstracts have been produced and two scientific papers have been presented and published: *"EMF Levels from Small D.C. to A.C. Power Conversion Systems"* and *"Assessment of Magnetic Field Exposures from Tape Degaussers"*.

- **Acoustics:** A presentation was made for the department at the Goose Bay hearings on low level military aircraft overflights - *"Assessment of Adverse Effects on Humans of Environmental Aircraft Noise Generated by Low Flying Military Training Flights (LFMTF)"*. The presentation included a review of the research done to date in this area and basically concluded that "there is no convincing evidence that exposure to aircraft noise in the area surrounding Goose Bay Airport or in the low-flying training areas, under present or future conditions, causes an increase in the incidence of cardiovascular disease, mental or psychosomatic illnesses or adverse pregnancy outcomes and... it is unlikely that people... will incure measurable permanent hearing loss due to environmental aircraft noise from low flying military training flights." In addition, Health Canada provided advice to Transport Canada on their new Land Use Compatibility Guidelines and on a draft technical report on the Noise Exposure Forecast measure of community noise. A number of conference presentations have been made but research results are only preliminary.

Assessment of the Initiative's Success

It is difficult to assess this initiative in terms of the overall goals and objectives. However, by measuring against the specific goals and objectives of the various initiative components, the success of the individual study areas can be more easily assessed.

It is apparent that, as a whole, the ionizing radiation component has been fairly successful in accomplishing what it set out to do under its four activity areas; i.e., the FNERP has been revised; the National Calibration Reference Centres have been updated; the National Monitoring Network has been reviewed and some modernization has taken place with the purchase of more sensitive measuring equipment; and, a groundbreaking study of the health impacts of uranium in drinking water has been completed.

With the exception of the activities under the UV Solar component, a large part of what should have happened under the non-ionizing component has not yet been accomplished. Results of the research studies conducted to date are considered to be preliminary and further work must be done to validate the results produced so far. However, some input into formulation of guidelines (e.g., Transport

Canada's Land Use Compatibility Guidelines) has occurred and there have been a number of presentations at scientific conferences as well as publication of abstracts and papers.

With exception of the UV Solar component, most of the information produced as a result of initiative activities has been communicated through peer-reviewed scientific journals.

4.1.5 St. Lawrence Health Effects Program (SLHEP)

Goals/Objectives

This initiative received partial funding under APHE and is due to be completed in March 1998. The initiative is comprised of the Health component of a much broader federal/provincial program, St. Lawrence Vision 2000. The overall goal of St. Lawrence Vision 2000 is to conserve, protect and restore the St. Lawrence River. It has seven major components: Biodiversity; Agricultural Clean-Up; Community Involvement; Decision Support; Health; Protection; and Restoration. The Health component is the only component of St. Lawrence Vision 2000 to be supported under APHE. The funding of this initiative is as follows: $1 million from APHE; $10 million from St. Lawrence Vision 2000; and an in-kind contribution of $6.5 million from the Quebec Ministry of Health and Social Services. The Health component is managed jointly by Health Canada and the Quebec Ministry of Health and Social Services.

The overall goals of SLHEP (the Health component of the latter program) are as follows:

- to protect human health in the St. Lawrence River Basin from the effects of exposure to contaminants in the environment;
- to study the relationship between the St. Lawrence River and human health;
- to assess the risks of specific contamination; and,
- to monitor three uses of the St. Lawrence River: consumption of fish and seafood, consumption of drinking water drawn from the river, and recreational activities.

Accomplishments

Under the St. Lawrence Health Effects Program, the following has been accomplished to date:

- a number of public consultation meetings have been organized and 12 priority areas of intervention have been established;
- ten Coordination Team meetings were organized and the Health Harmonization Committee merged and formed one group: the Harmonization Committee;
- perceptions of health risks by affected populations have been surveyed; e.g., a survey with over 18,300 respondents has been undertaken;
- an inventory of current scientific knowledge on health matters related to the St. Lawrence has been generated;
- over 25 studies were initiated during the period of 1993-1996 in areas pertaining mostly to exposure to contaminants. Studies were conducted with regard to the St. Lawrence basin as a whole, and in regard to specific groups; e.g., First Nation groups living on the North Shore, Mohawk communities around Lake St. Louis, and newly arrived immigrant groups in the Montreal region.;
- technical reports in 3 priority areas of intervention (ZIP) have been produced;

- an overview (or bilan) of water quality in the St. Lawrence has been produced;
- approximately fifteen reports and one video , *"In Sickness and in Health: The St. Lawrence River"*, have been produced to date;
- an Agreement was negotiated with the Province of Quebec leading to a $6.5 million in-kind contribution, and an Agreement was also negotiated with the Programme national de recherche de développement en matière de santé and the Fonds de la recherche en santé du Québec which resulted in an additional $2 million being invested in the establishment of a Knowledge Development Fund;
- a communication plan was developed in collaboration with the Health Canada regional office for Quebec; and,
- a health colloquium was organized for the Quebec environmental health community and a seminar was held on the pilot phase of the "Exposure of the Gulf of St. Lawrence population to organochlorines".

Assessment of the Initiative's Success

In looking at the objectives for this initiative, there is evidence to suggest that the initiative is addressing at least two of the four objectives; i.e., it is studying the relationship between the St. Lawrence and human health, and it is assessing the risks of specific contamination. However, there is no evidence to date of monitoring or risk management activities to protect human health in the St. Lawrence River Basin from the effects of exposure to contaminants in the environment. However, as the initiative started two years late, it may be too early to assess the extent to which objectives have been achieved.

There remains a lot of data to be collected and analysed under this initiative and the results of many studies have yet to be finalized. The majority of the information available to date has been disseminated within the scientific community and/or the public health system, and external stakeholders indicated that there still remains a lot to do with regard to the communication of results and the undertaking of risk management activities. Further, there was no evidence provided to indicate the number of communities involved in this initiative.

It was noted that the initiative is not due to be completed until March 1998, and there are several communication activities planned during the latter part of the initiative. Hence, there is little evidence available with regard to remedial actions taken at the community level and there is no evidence of changed behaviours as a result of the information presented.

It was noted that unlike other APHE initiatives, SLHEP is delivered in a decentralized manner through the existing regional health infrastructure in the Province of Québec. Respondents indicated that the majority of the scientific activities were being undertaken outside Health Canada. The Knowledge Development Fund is the first of its kind, and according to Health Canada, was established to respond to the particular needs of university researchers.

According to the stakeholders interviewed, this initiative has contributed to a significant increase in the amount of available scientific information related to the health effects of the St. Lawrence. Consequently, there has been an increased level of general awareness of health issues in this region.

4.1.6 Environment-Related Disease Surveillance (ERDS)

Objectives/Goals

There are two distinct components of this initiative: the Asthma Component and the Cancer Component.

Asthma Component

The goal of the asthma component was to reduce the mortality and morbidity due to asthma, of which environmental factors play an important role.

There were three main areas of activity under the Asthma Component:

1. National Asthma Surveillance

   This included the establishment of a national asthma surveillance database to monitor the impact of asthma, collection of new data on asthma prevalence, and incidence, severity, risk factors, drug use, medical and health services use and treatment. This information will allow better understanding of asthma mortality and morbidity trends, and facilitate the planning, implementation and evaluation of effective asthma preventive and control measures.

2. Targeted Risk Assessment

   In collaboration with researchers, an epidemiological study was conducted to identify risk factors for fatal and near-fatal asthma. This information will allow LCDC and other stakeholders to implement effective strategies to prevent unnecessary asthma deaths in Canada.

3. National Asthma Control Strategy

   A National Task Force, represented by stakeholders and interest and consumer groups in this area, was established to develop a "National Strategy for Asthma Control". National asthma control goals and objectives and strategies to achieve these goals were developed.

   In addition, physician and patient asthma education projects, aimed at reducing the impact of asthma, were undertaken.

Cancer Component

The goal of the cancer component was to reduce the burden of cancer that may be related to environmental factors through implementation of an enhanced national cancer surveillance system

The cancer component incorporated four project areas: an environmental quality database(EQDB); a case control component which collects data on environmental exposure, residence and lifestyle; a geographic surveillance of cancer incidence; and, a hot issue management component. Briefly:

1. EQDB

   The Environmental Quality Database was developed to provide easily accessible information regarding environmental quality and potential hazards. Activities focused on the creation of a national inventory of waste disposal sites, an inventory of estimated emissions from industries, and the collection of data regarding municipal drinking water, water treatment by-products and air contamination.

2. Case Control Component

The objective of this component was to assess the impact of environmental pollution on cancer risk by collecting data in co-operation with Provincial Cancer Registries regarding newly diagnosed cancer patients and a population control group. Questionnaires were used to obtain information from cases and controls regarding lifetime residential and occupational histories as well as other cancer risk factors in order to assess the impact of environmental pollution on cancer risk.

3. Geographic Surveillance Component

Activities of this component focused on methods to detect cancer incidence patterns across Canada; cluster analysis through the mapping of incidence in order to identify high risk cancer areas; updating the quality of cancer registry data; and, producing a cancer incidence atlas with maps based on the census division level.

4. Hot Issue Management:

The goals of this activity area were to manage specific public concerns regarding the development of certain cancers and environmental risk exposure, and to develop strategies to identify and address emerging issues.

Accomplishments

According to interviewees, the major accomplishments of this initiative by component are as follows:

Asthma Component

- **Establishment of a National Asthma Surveillance Database**The data permits the monitoring of the impact of asthma in Canada and the evaluation of the impact of asthma prevention and control program activities;
- **New information** was obtained on the prevalence of asthma and its risk factors among adults in Canada through the Adult Asthma Surveillance Study;
- **Other surveillance projects** are underway: the *"Asthma Module of the 1996/97 National Population Health Survey"*, the *Asthma Incidence and Prevalence Surveillance Project*, and the *Asthma Drug Surveillance Project*; and, a survey to determine the asthma management practices of physicians across Canada. These surveillance projects have and will continue to provide valuable information for the Laboratory Centre for Disease Control (LCDC) and other stakeholders in the planning, implementation and evaluation of effective asthma prevention and control activities in Canada;
- A **"Fatal Asthma Study"** conducted in Alberta, Saskatchewan and Manitoba to determine the risk factors leading to asthma deaths in Canada is almost completed. Findings will assist in formulating strategies to reduce asthma deaths in Canada;
- An **Asthma Control Task Force** was formed to establish National Asthma Control Goals and Objectives (completed) and formulate strategies to achieve these goals and objectives (underway);
- Through the **Canadian Network of Asthma Care (CNAC)**, Canadian Asthma Management Guidelines were published to educate physicians on appropriate care of asthma patients. Two asthma patient education projects are currently underway in collaboration with other members of CNAC; and,

- Co-sponsored:
  - two "National Conferences on Asthma and Education" with CNAC; and,
  - "Multiple Chemical Sensitivities (MCS) and Their Relevance to Psychiatric Illnesses Workshop" to educate professionals and patients on MCS and explore research directions.

In addition, the component activities enabled LCDC to establish strong alliances and collaborative relationships with major stakeholders in the area of asthma in Canada. This will facilitate future work.

Cancer Component

- An innovative **Enhanced Cancer Surveillance (ECS) System** has been developed which will analyse not only environmental and cancer incidence data, but individual risk factor information for cancer cases and population controls. For example, the system uses residential information to extend risk assessment to broader patterns which incorporate mobility and latency. The need to consider these important factors had been discussed widely in the past, but until now, such a system had not been developed. This concept is considered to be an important advance.

  In turn, the ECS has resulted in the creation of a number of major databases including:

  - The **Environmental Quality Database (EQDB):** This is a large systematic inventory of indicators of air and water quality synthesized from many sources of public information. Combined with either the case-control data and/or the GIS data, this is a powerful tool unavailable in other countries.
  - The **Case-Control database**: This database adds major enhancements to the ongoing surveillance activities by allowing comparison and evaluation of mobility and latency and will facilitate studies into the effects of environmental pollutants while controlling for other important lifestyle factors.
  - A **Geographic Surveillance System (GSS):** This surveillance activity translates incidence data into on-screen maps which graphically identify high incidence areas facilitating time trend and cluster analysis. An interface with environmental information is being developed to layer potential environmental concerns over incidence data.

  The ECS system is now in the process of assembling final data from over 20,000 cancer cases and healthy controls and entering the data. Analytical activities from this data could occur for at least five years. The integration of case-control and environmental quality databases allows for the estimation of a lifetime environmental exposure assessment for individual cases and controls. An integrated system of this type is unique not only in Canada but in the US and abroad. Similar inventories exist on a small scale but this comprehensive national system linked with case and control residential histories has attracted international interest.

- This system also includes information activities, the coordination of follow-up activity, and the provision of solutions through the Cancer Hot Issue Management. This is an ongoing process of addressing current and emerging issues such as ultraviolet radiation and skin cancer, radiation and thyroid cancer, organochlorines and breast and prostate cancer, and chlorination by-products in drinking water and bladder, colon, and rectal cancer. New information is constantly generated by targeted investigations and risk assessment of emerging issues.

- With the help of these systems, Health Canada can address hot issues that derive from both community concerns and from evidence generated through the surveillance activities. Expertise and funding are provided for collaborative risk assessments.

In addition, interviewees indicated that the cancer component activities have:

- facilitated major strides in the systematic estimation of future cancer risks across Canada. Working with the provincial cancer registries, methods are being standardized to ensure the compatibility of cancer projection data and statistical methods used by all provinces. Methodologies and software have been developed and provided to the provinces;
- contributed to improvements in registry reporting and recording systems in Quebec and in the eastern provinces. A Canadian Cancer registries monograph has been produced which provides a solid background about cancer registration in Canada, defining demography, cancer classification, data sources and registration procedures. It also provides important information about data quality assurance and gives time trend information for 20 cancer sites;
- linked chlorination by-products in drinking water to bladder cancer and colon cancers through the study results from the targeted risk assessment in the Great Lakes region. As a result of this and other studies, the Environmental Health Directorate is reviewing current methods of drinking water disinfection and considering alternative methods such as UV light; and,
- results of a targeted risk assessment pilot study in Saskatchewan contributed to the body of knowledge needed for review by EHD of the guideline for natural uranium levels in drinking water.

Under the Geographic Cancer Surveillance activities, a Western Cancer Incidence Atlas has been produced. The National Cancer Incidence Atlas of Canada is at the printer and is close to being released.

Under the Hot Issue Management activities, Health Canada has funded targeted studies on UV radiation and has facilitated several conferences to develop and implement risk management strategies on this subject.

The information produced to date has been distributed to the public through 13 information packages, circulars, and newsletters. In addition, over 30 scientific articles and 48 reports have been published, 20 workshops have been held, and presentations made at more than 25 conferences between 1993-96.

Assessment of the Initiative's Success

Asthma Component

In the opinion of Health Canada interviewees, the asthma component has been successful in contributing to:

- the establishment of a solid infrastructure and network for continuing work in asthma surveillance and prevention and control;
- a better understanding of the impact of asthma in Canada, asthma trends and risk factors;
- the identification of high risk groups and areas of needed intervention;
- the establishment of national asthma control goals and objectives; and,
- identification of strategies to reduce asthma mortality and morbidity in Canada.

Although, the asthma component activities have not yet met the stated objective of "reducing the mortality and morbidity due to asthma ......", it may be that the successful contributions noted above will lead to a reduction in mortality and morbidity due to asthma, but only in the long term.

Cancer Component

According to Health Canada interviewees, after APHE there will be a good base of data available that is suitable for analysis. This database will provide a basis for risk assessment work for about five years, after which the database will require renewal.

The Environment-Related Disease Surveillance has built a good structure for cancer surveillance, risk assessment, and risk management including a collection strategy, data management and analysis systems, and a national collaborative network. According to interviewees, this system synthesizes both cancer risk factors and environmental information; i.e., unlike other systems, it allows for the examination of the lifetime impact of residence in proximity to sources of environmental concern, accounting for both population mobility and cancer latency. By focusing on the individual, the database is being used to evaluate the impact of targeted risk factors on cancer incidence.

The initiative has facilitated important advances in systematic cancer projection across Canada. Efforts are being made to ensure compatibility with projection data for each province on the basis of provincial cancer registries. Provincial authorities reported an improvement in their cancer registry data as a result of the interface with the ERDS cancer program. For example, APHE funding has facilitated the upgrading of registry data to include addresses and postal codes, which are considered to be key elements for any surveillance systems. At this point in time, the cancer registry data from Quebec and New Brunswick have not yet been integrated into the case-control component due to budgetary cuts and differences in their data systems with those of Health Canada.

Stakeholder interviewees indicated that the case control activities undertaken as part of this initiative have made an important contribution from a science point of view. Researchers will be able to continue to add to the knowledge base which will, in turn, provide a good base for future research activities.

In the opinion of interviewees, the overall strength of this component has been the ability to facilitate studies across Canada and hence generate useful comparative data. The focus on ambient air quality was also regarded as an important strength. In addition, the scope of activities enhanced by APHE funding has changed the structure of the Bureau and the Directorate.

The main problems for Health Canada in this initiative have been the impacts of resource cutbacks, both personnel and funding. The nature of this work is long term, and dependence on contract positions as well as ongoing tensions due to cuts and cancellation of project activities made the job of promoting an innovative concept in surveillance difficult for Health Canada managers. This was supported by stakeholders who perceived there to be a lack of planning and coordination during this program. A number of them expressed concern that they were not involved in the initial stages and that there was room for improvement in joint federal-provincial undertakings.

With the exception of a few studies, project results have been mainly distributed to researchers, universities, libraries, cancer agencies and within the department.

4.1.7 Market Basket Survey (MBS)

Goals/Objectives

The goal of this initiative was to "produce baseline data on pesticide, contaminant and metal content of the Canadian food supply as it is consumed. The data collected and analysed is an indicator of the quality of the food supply and will be used to calculate intakes of the measured chemicals by the consuming public."

Food was to be sampled from two Canadian urban centres per year and prepared as for consumption, since processing can result in the destruction of some compounds and the transformation or concentration of others. Pesticide and trace elements were to be determined in these composite samples. Data for elemental analysis of composites from all regions were to be analysed and tabulated. In addition, methodology was to be developed to expand the scope of the chemicals determined.

In addition, the Market Basket Survey studies will:

i enable Health Canada to study the effect of "bans"; e.g., the level of dioxins/furans in the diet are dropping steadily due to the impact of banning emissions of toxic substances from pulp and paper mills; and,

ii) monitor trends; e.g., the level of iodine is trending slowly upward (the level of iodine is not yet alarming; however, the upward trend is of concern).

Accomplishments

According to interviews with Health Canada personnel, the field work has been completed and the data is in the process of being collected and analysed. Therefore, there are no results to report on the Market Basket Survey at the time of writing this report. However, there have been a number of outputs produced to date from initiative activities. These include six reports and technical papers, four invited presentations, two unsolicited presentations at conferences, and a book chapter, *Considerations in the Estimation of Recovery in Inorganic Analysis*, in "The Use of Recovery Factors in Trace Analysis", Ed. M. Parkany, International Standards Organization, Geneva, 1996, pp 5-23.

Assessment of the Initiative's Success

Although it is too early to comment on the initiative's success, interviewees indicated that there has been extensive methods development throughout the Market Basket Survey. More sensitivity was needed in order to detect small amounts of the compounds under study. This was accomplished through the modification of multi-residue detection methods whose sensitivity proved inadequate in a previous similar study in the mid-80s. Heightened sensitivity of detection enabled them to expand the scope of the Market Basket Survey in terms of the numbers and nature of the compounds studied.

APHE funds allowed the Food Directorate to "revamp" the program; i.e., the initiative funding increased the numbers of substances studied and enhanced the ability to test for certain substances; e.g., aluminum has always been difficult to test for and a test has been developed. Finally, APHE allowed the directorate to devote resources/staff to the Market Basket Survey. Previous to the APHE, these studies were done sporadically, depending on the availability of money and staff time.

The ultimate beneficiary of these studies is the Canadian public. Data produced to date has been incorporated into various HPB public-oriented documents (e.g., *A Vital Link*). In addition, through a series of Food Directorate consultations in the North, Health Hazard Assessment discussions in community-based workshops have provided MBS results.

4.2 Groups at Risk

There are four initiatives addressing groups at risk under APHE. These are:

- Drinking Water Safety Program for Native People;
- Effects on Aboriginals from the Great Lakes Environment;
- Pregnancy and Child Development; and,
- Northern and Arctic Pollution.

This section addresses the following evaluation questions:

Q.2 How many First Nations community water systems are in and out of compliance with the most recent Guidelines for Canadian Drinking Water Quality? What impact has the Drinking Water Safety Program-Natives initiative had on these numbers, and how was this impact achieved?

Q.7 What health risks to these groups have been identified under the initiatives? How has information collected under the initiatives been distributed to these groups? Has information been distributed promptly? How has the information been used in managing health risks to these groups from their environment?

Q.12 For DWSPNP and EAGLE, what has been the Department's success in developing partnerships with Aboriginal Canadians, with professional organizations, with voluntary health and social groups, and with the private sector, to increase individual and community action on health, environment and sustainable development issues?

a. How many communities participated in the activities of the Initiative?

b. How many communities succeeded in meeting objectives they had set for themselves with the Initiative? What actions were taken by these communities on health, environmental or sustainable development issues, and what were results of these actions?

These initiatives were intended to address health equity concerns by monitoring, regulating, and making information available to target groups (Aboriginal persons, pregnant women, children, and people living in the North) with regard to the health effects of environmental contaminants. The initiatives under the "Groups at Risk" component of APHE were intended to support the delivery of services to those groups deemed to be most vulnerable to environmental contaminants.

Sections 4.2.1 through to 4.2.4 below summarize the specific results achieved by each of the four initiatives as well as the study team's assessment of each initiative's success in meeting its goals/objectives under APHE. More details on these initiatives are provided in Appendix B.

4.2.1 Drinking Water Safety Program for Native People (DWSPNP)

Goals/Objectives

The objectives of the Drinking Water Safety Program for Native People were to:

- increase sampling and analysis of existing drinking water supplies for chemical and bacteriological quality;
- provide advice to First Nations and the Department of Indian and Northern Affairs on the design, maintenance and operation of community water systems;
- develop a training package for First Nations water treatment plant operators; and,

- promote the importance of having a potable water supply through various educational materials.

There were four main areas of activity; i.e., monitoring of drinking water quality, training of Aboriginal individuals (Circuit Rider Training), database development, and public education of the importance of having a potable water supply.

Accomplishments

As a result of the activities of this initiative, the following has occurred:

- **Increased monitoring of drinking water quality:** Under this initiative, 863 community water and 425 sewage systems were reviewed as part of the Community Drinking Water and Sewage Treatment Study in First Nation Communities. The results of the survey found that, of the 863 community water systems examined, 20 per cent (171) have the potential to affect the health and safety of the community if problems are not addressed. Another 5 per cent (40) of the community systems are in need of repair or improved maintenance as they could pose a health risk to the community should they malfunction before the problem is addressed. Of the 425 community sewage treatment systems examined, 9 per cent (39) were experiencing problems that could potentially affect the health and safety of the community. Another 6 per cent (25) were in need of equipment repairs or improved maintenance practices, and there was potential for risks to health if a malfunction were to occur.

  As part of a baseline sampling program, over 1000 community water supplies were tested for a list of 56 chemical and physical parameters under a baseline sampling program. As a result, it was found that approximately 10 per cent of the water systems had exceedences of aesthetic parameters, while 5 per cent had exceedences of health parameters. The results have been entered into a database for later reference. Reports have been presented to all communities which participated in their national baseline survey. The reports illustrate the results, as well as identify the exceedence and potential sources, health effects and treatment for the parameter(s) in question.

  Other chemical sampling projects were initiated in various First Nations communities across the country. They included watershed studies, sampling of water storage tanks, cottage lease surveys, testing for hydrocarbons, pesticides and Trihalomethanes (THMs).

  Other specific accomplishments related to monitoring of drinking water quality include:

  - the expansion of the water quality monitoring program, using Presence/Absence techniques, by the West Region Tribal Council;
  - establishment and maintenance of a data collection system for community water system profiles and water quality by the Tribal Councils in Saskatchewan; and,
  - establishment of community-based laboratories, which monitor the microbiological quality of drinking water, in over 150 First Nation communities.

- **Training:** The Circuit Rider Training Program, which trains water treatment system operators, was delivered in partnership with the Assembly of First Nations to 13 communities in Northern Ontario. Fifty-five individuals completed the training program between January 1 and December 31, 1995. The course is now in the process of being expanded to the Western provinces. In Manitoba, the program will be delivered in partnership through the West Region Tribal Council.

A Native Water Treatment Plan Operators Association has been formed in Ontario to aid operators with technical information, training and advances in water treatment.

The Split Lake Cree First Nation has established a training centre for Presence/Absence testing. Split Lake has had 5 training sessions in which 36 First Nation communities have participated.

A Presence/Absence training video had been produced and presented to a number of First Nations communities.

- **Database development:** Two databases have been developed:
  - the database on water quality compliance which is intended to be used by regional/community representatives (at this point in time, the database on compliance is not up and running as the data remains on hard copy); and,
  - a database which provides a detailed profile of communities, including an inventory of equipment, source of water and treatment methods.
- **Public Education:** A number of materials to increase public awareness have been developed and delivered (e.g., videos, posters and booklets, organization of events, etc.). In addition, the initiative has supported a number of community-based activities such as shore clean-up campaigns, cleaning of fuel and sceptic tanks, etc.

A Water Treatment Plant Operators Committee, consisting of representatives from Health Canada, DIAND, AFN and various First Nation communities, was formed and meets on a regular basis to discuss matters related to community water treatment systems.

Assessment of the Initiative's Success

From the above, it is apparent that the DWSPNP is addressing its objectives; i.e., there is evidence that the initiative has contributed to: increased sampling and analysis of existing drinking water supplies for chemical and bacteriological quality; provision of advice to First Nations and DIAND on the design, maintenance and operation of community water systems; development of a training package for First Nations water treatment plant operators; and, promotion of the importance of having a potable water supply through various educational materials.

Two software application databases, including the one on compliance, have been developed. These are used to assist field personnel in the collection of data, and issuing reports to clients regarding descriptions of environmental infrastructure (e.g., water treatment plants) and results of water sample analyses. These applications are in operation in the majority of regions and data is being collected, analysed and shared with First Nation communities in question. However, the main evaluation question (noted above) to be addressed by this initiative cannot be answered at the time of writing this report, as statistics on the number of First Nation community drinking water systems in and out of compliance with identified bacteriological and chemical parameters were not made available to the study team. Furthermore, it is not possible to determine to what extent this initiative has had an influence on overall compliance trends.

According to interviewees, the Drinking Water Safety Program for Native Peoples has been generally successful in:

- contributing to the development of local capacities (technical and managerial) through training programs. Locally recruited water treatment plant operators have been trained and linkages with community health practitioners have been reinforced. Training materials and testing methods have been adapted to the needs of remote communities, and are delivered in a manner which is consistent with the notion of self-reliance. In addition, the initiative has contributed to the development of appropriate technologies, and participating communities have reduced their reliance on distant laboratories for the early detection of water contamination;

- providing the communities with more timely information in terms of bacteriological sampling (there has been a reported reduction in the turn-around time of up to two weeks). Consequently, a community is able to initiate remedial action in a more timely manner;
- contributing to an increase in the frequency of testing within communities which have thus far participated in training programs. Consequently, information is provided to health authorities and affected individuals in a more timely manner; and,
- increasing public awareness of potential health problems related to a poor quality community water system.

There is also some evidence, albeit anecdotal in nature, that the initiative has contributed to a reduction in the incidences of water-induced illness in project catchment areas and to improved water quality as a result of training in new monitoring techniques.

Communication of results has been primarily within participating communities. If a serious health problem is detected, the Medical Services Branch at Health Canada prepares a letter in which the problem is identified and recommendations on possible remedial measures are made. There is also regular reporting to the communities on the training of their operators and the monitoring of their water treatment plant systems.

In addition to the reported successes of the initiative activities, a small number of weaknesses or problems were identified by interviewees:

- there is a great deal of First Nation staff turnover and, consequently, training is a continuous activity; and,
- the initiative has created high expectations for funding support and currently the demand by communities to participate cannot be met by current funding levels.

4.2.2 Effects on Aboriginals from the Great Lakes Environment (Project EAGLE)

Goals/Objectives

The goal of the EAGLE Project was to blend community and scientific knowledge in a partnership to examine the effects of contaminants on the health and well being of the Great Lakes Native populations.

EAGLE is a partnership between the Assembly of First Nations (AFN), Health Canada's Medical Services Branch (MSB) and 63 First Nation communities from the Great Lakes Basin. EAGLE's coordinating office at AFN in Ottawa is responsible for the day-to-day management and coordination of all Project activities.

There are six major activity areas:

1. **Eating Pattern Survey:** Begun in May 1992, the survey provides information on the consumption of freshwater fish and wild meat by community members (e.g., data on species consumed, portion size, portion consumed, harvesting sites and community demographics).

2. **Fish Contaminant Project:** The project was intended to determine the levels of contaminants in fish and wild game consumed by First Nations people for which existing data from the Ontario Ministry of the Environment and Energy was inadequate.

3. **Contaminants in Human Tissues Program:** This component involved analysing samples of blood for over 40 different PCB congeners and 35 organochlorine contaminants. In addition, hair samples were analysed for mercury. Pesticides were analysed for as well.

4. **Health Survey:** The Health survey will be used to assess the health status of First Nations communities and relating it to environmental quality.

5. **Socio-Cultural Program:** This program is intended to identify and measure Socio-cultural "quality of life" indicators of health and well being in communities. The methodology is blending knowledge and information from Elders and other community members with the standard information that is collected in epidemiological studies. The approach is being pilot tested in four communities.

6. **Geographic Information System:** This system is being used to display and analyse traditional knowledge and scientific information on First Nations health and environment.

Accomplishments

As of May 1996, 44 of the 63 communities in the study area were active in the subcomponents of this initiative. Participation in the various sub-components of EAGLE was varied.

Specific accomplishments under each of the activity components include:

- **Eating Pattern Survey:** The Survey has been completed. It covered 32 First Nation communities, which represented a population of over 1,300. Sub-components included a pilot project, recalls on fish consumption, a model estimation experiment, retest analysis and analyses of consumption patterns. Interim findings indicate that First Nation peoples in the Great Lakes Basin are exposed to high levels of contaminants. This has been attributed to their consumption of fish and wild meats.

- **Fish Contaminant Project:** In collaboration with the Ontario Ministry of the Environment and Energy, EAGLE has developed community-specific fish consumption guidelines. This involved collecting over 600 individual samples of 11 different species of fish among 12 of the 19 communities that participated in the Eating Patterns Survey in 1993. Revised fish consumption guidelines are expected for the 33 communities which participated in all key components of the initiative.

- **Contaminants in Human Tissues Program:** The blood sampling program was expanded to include 205 people in 11 communities.

- **Health Survey:** Field work started in the fall of 1995. It has been completed/ is underway in 26 communities. A modified version of the Ontario Health Survey was developed and is being used to collect the data which is to be compared to geographic counterparts from the Ontario data. Statistical work will be performed on this data to provide good morbidity and mortality data, which was found to be lacking.

- **Socio-cultural Program:** Work is continuing on the development of community-based indicators of health and well-being, and of a social-cultural program.

- **Geographic Information System:** The base map for the entire basin has been completed.

According to Health Canada respondents, one of the most important overall accomplishments of the EAGLE project has been its adoption of a holistic approach to Aboriginal health; i.e., the approach includes the consideration of "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" as defined by the World Health Organization (WHO). In-direct health effects of environmental contaminants considered under the EAGLE program include change of diet, change of lifestyle, social/cultural disruption, and at a tertiary level: diabetes; obesity/loss of fitness; violence (community/familial); alcoholism/drug abuse; and, suicide.

Assessment of the Initiative's Success

From the above, it can be said that the EAGLE Project has been successful in addressing its overall goal; i.e., there is strong evidence that the initiative has contributed to the blending of community and scientific knowledge in a partnership in its examination of the effects of contaminants on the health and well being of the Great Lakes Native populations. However, the extent to which the initiative has met its specific objectives to date is limited. Nevertheless, there have been a number of positive steps made to date and these are discussed below.

The initiative is predicated on the notion of community empowerment through improved access to information. One of its fundamental goals is to provide Aboriginal people with accurate and reliable information so that they can make decisions themselves with regard to their desired level of exposure to risk. In light of this, tangible health benefits from this initiative are expected to be derived from the development of community-specific guidelines on safe fish consumption. These are in the process of being communicated to participating communities using various media according to community preferences. The initiative has devoted considerable effort to the communication of results in a manner which is deemed appropriate to all stakeholders. Extensive consultations have been held with participating communities, and the coordination of study results is facilitated via regional representatives employed by the AFN.

In terms of its success, the EAGLE Project is considered to be an important model for community-based research in First Nation communities. In particular, according to interviewees, this initiative has been successful in:

- establishing and maintaining a strong partnership with the Assembly of First Nations in carrying out its activities. The program is essentially delivered by the AFN, with MSB providing the necessary technical support;
- contributing to the development of technical and managerial capacities within the AFN and to significant development of human resources within participating communities (e.g., hiring of research assistants to administer surveys, development of social mobilization products, etc.);
- contributing to a significant increase in understanding throughout the Great Lakes Basin, about how environmental contaminants affect First Nations health and well-being. [14] This assertion was corroborated during interviews with First Nation representatives;
- demonstrating that Western science and traditional knowledge can be compatible; and,
- demonstrating that Aboriginal people and non-Aboriginal people can work together in partnership.

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[14] 1995-96 Annual Report, EAGLE Project

According to stakeholder interviewees, the degree of satisfaction with the EAGLE initiative in participating communities is high. The program is voluntary, therefore progressive gains in participation rates at the individual and community levels are a positive indication that the program is responding to community needs. As an example, in 1995/96, five new communities, which were previously reluctant to do so, agreed to participate in the EAGLE Project.

In terms of community actions and results, this is just starting to happen. According to Health Canada interviewees, these will be in response to fish consumption advisories. These will be specific for each community (approach the communities wanted), based on level of contamination of frequently consumed fish in that community.

4.2.3 Pregnancy and Child Development (PCD)

Objectives/Goals

There were two components to this initiative: a Native Component managed by the Medical Services Branch (MSB) and the Non-Native Component managed by the Laboratory Centre for Disease Control (LCDC).

MSB Component

The overall objective of the MSB component was to assess the effects of environmental contaminants on pregnant First Nation mothers and their babies. Because of reprofiling of APHE resources, funds were only available under this specific initiative in one fiscal year (1994/95). In that year, partnerships were established with two First Nations, the Grassy Narrows First Nation and the Wabaseemoong independent First Nations, to conduct two pilot studies to verify whether methylmercury, a contaminant found in fish, has had an impact on the development of children.

LCDC Component

The overall goal of this component was to provide a comprehensive program of enhanced surveillance and disease control for reproductive health as it relates to the physical and social environment.

There were five areas of activities:

1. Canadian Child Health Atlas: The goal of this activity was to produce the first-ever national summary of the state of the health of Canadian children on a sub-provincial basis. This was a multi-year project with the Canadian Institute of Child Health. The atlas shows the clear geographic differences in disease (and therefore risk) on a small area (county) basis across the country in terms understandable by the lay person.

2. Farm Health Study: The goal of this activity was to better understand the reproductive health of farm families, as it relates to the general milieu of occupational and lifestyle exposures encountered on farms (with an emphasis on pesticides).

3. PEI Reproductive Care Study: The goals of this study was to establish a perinatal data base in Prince Edward Island, to undertake environmental risk assessment of perinatal health in the province, and to apply the experience in PEI to the establishment of a national database (National Perinatal Surveillance System). This is a multi-year study which was fully contracted to the PEI Reproductive Care Program (RCP) in Charlottetown. RCP believes that pregnancy outcomes are influenced by events that occur in the pre-pregnancy, pre-delivery and delivery periods and as such, the database contains information on maternal demographic information,

prenatal interventions as well as births and perinatal/neonatal morbidity and mortality. (Names of patients, physicians or other individuals involved with health care are not recorded in the database.) Data from this database will form the basis for further research and possibly assist in changing reproductive care.

4. Disease Control Programs - SIDS and NTDs: The goals of these two programs was to continue LCDC's collaboration with intradepartmental and external partners for national prevention programs for Sudden Infant Death Syndrome (SIDS) and Neural Tube Defects (NTDs).

5. Canadian Perinatal Surveillance System (CPSS): This project was enhanced by APHE funding (other funding involved - Tobacco Demand Reduction Strategy). (After the first 2 years of APHE, the originally planned National Birth Outcomes Study, was folded into this project).

Accomplishments

As a result of the activities carried under the Pregnancy and Child Development initiative, the following has occurred:

MSB Component

This project was for one year (1994-95) only under this initiative but was then continued under the Northern and Arctic Pollution initiative. There are no results to report at this point in time as data is continuing to be collected. What remains to be done is validation of the data, analysis and reporting.

LCDC Component

- **Canadian Child Health Atlas:** The Canadian Child Health Atlas has been produced and is available at a small cost from the Canadian Institute of Child Health. The atlas provides information about children's (under 19 years of age) hospitalization patterns in a pictorial geographic presentation to providers, parents, care givers and policy makers. Four areas are plotted: respiratory illness; injuries; gastrointestinal illness; and, perinatal conditions.

  Highlights identified in the atlas include the following observations:

  - Children living outside Canada's major cities, particularly in the Maritimes (PEI, NB, NS) and western provinces (BC, Alberta and Saskatchewan)) are more likely to be hospitalized than their urban counterparts; and,
  - Infants under 1 year of age are at the highest risk of hospitalization most commonly for respiratory illness.

- **Farm Health Study:** All the data was collected in Ontario. This study was initially intended to be national in scope. Eighty-five (85%) per cent of the dollars for this project was directed at research, while the remaining 15 per cent was intended for communication of the results via the newsletter *Farm Family Health* (7 issues in both official languages have been produced to date). There are two parts to the research; i.e., the Farm Family Health Study and the Pesticide Exposure Assessment Study which is just starting.

  Preliminary results were presented at the First Annual National Canadian Farm Safety Conference. This was the first public presentation of results, and the Canadian Coalition for Agricultural Safety and Rural Health (made up of all interested stakeholders and which is the main vehicle for dissemination of information on health and safety issues for Agriculture Canada) was present. As a result, farmers were basically advised to wear protective clothing when spraying pesticides in order to minimize the risk of being exposed to pesticides. In addition, results have also been communicated through scientific papers and some TV interviews (The Farm Show).

- **PEI Reproductive Care Study:** To date three years (1992-94) of data have been entered into the computerized Reproductive Care Program (RCP) database (it is anticipated that 1991 data entry will be completed by the end of June 1996). Currently data cleaning and conversion is underway. Once data entry is complete, risk assessment work is expected to begin. The first study planned is a study on Adverse Reproductive Outcomes and Water Quality: A Case Control Study on PEI.

  A database report has been published for period of January 1, 1992 to December 31, 1993. The level of inquiry is that of descriptive statistics. No inferences or determination of statistical significance have been made.

- **Disease Control Programs - SIDS and NTDs:**

  Sudden Infant Death Syndrome or SIDS: Guidelines were produced for public education/professional education; i.e., *"Joint Statement on Reducing the Risk of Sudden Infant Death Syndrome in Canada"* . These have been adopted by Health Canada, health professionals and NGOs (Canadian Foundation for the Study of Infant Deaths, the Canadian Paediatric Society, Canadian Institute of Child Health). Knowledge has been shared with Products Safety (crib mattresses)and there was a poster, "Sweet Dreams" produced in collaboration with HPPB.

  Neural Tube Defects (e.g., spina bifida) or NTDs: A National Workshop was held in Ottawa in March of 1995 which resulted in the drafting of a number of guidelines aimed at prevention of NTDs (the risk is reduced if pregnant women eat a folate-riche diet supplemented by folic acid tablets) for health care professionals, NGO partners, Health Canada, provincial/territorial ministries of health, health care organizations. In addition, in preparation for the workshop, a number of background papers were prepared and distributed to workshop participants.

- **Canadian (National) Perinatal Surveillance System or CPSS:** LCDC is currently in the process of developing a common perinatal clinical care record - the Standard Clinical Practice Tool. The database is not yet in electronic form as they are in the process of identifying what information will be on it. A preliminary list of indicators has been provided to the CPSS Steering Committee members for review. The Standard Clinical Practice Tool is intended for use by policy makers, health programmers, organizations and researchers across the country.

Assessment of the Initiative's Success

MSB Component

It is too early to assess what impact the initiative has had on efforts to manage health risks related to the environment as data collection and consultations are on-going. It was noted that more parents and children became involved with the initiative as it progressed over time. Results will be communicated to individuals (i.e., parents), and community summaries will be prepared and disseminated to the Band Council and Educational Authority.

LCDC Component

As much work remains to be done, the LCDC component has not yet met its overall goal of providing a comprehensive program of enhanced surveillance and disease control for reproductive health as it relates to the physical and social environment. The CPSS database is not yet operational but the PEI Reproductive Child Care database is. In fact, the CPSS was only in the developmental stage at the time of this report.

However, some success has been achieved within the individual activity areas:

- the Child Health Atlas is considered to be a good tool for determining "what needs to be looked at?" in terms of future research activities;
- the NTD workshop and background papers have led to better information regarding folic acid and its impact on reducing the incidence of NTDs;
- the SIDS study has generated guidelines which make recommendations with regard to the sleeping position of babies, the temperature of their surroundings as well as the advantages of breastfeeding;
- the inclusion of socio-psychological variables in the perinatal database being developed in the PEI Reproductive Care Study has allowed this database to serve as a model for the CPSS;
- the activities of the Farm Health Study has received good support from the scientific community and there has been very good response to the newsletter. Interviewees indicated that some progress has been made with the rural community with regards to managing the risk of exposure to pesticides by wearing protective clothing; and,
- the Pesticide Exposure Assessment Study is drawing a great deal of interest from the international scientific community as it represents the first time that semen samples have been taken and that the family has been included in such a study. If pesticides are found in the semen, there may be implications for reproductive health.

In addition to what has already been noted above, the Farm Family Health newsletters have identified a number of environmental health risks to farmers and their families (tips and guidelines on how to reduce and manage the risk are also provided in the newsletter). For example:

- many farmers and their family members are afflicted with Noise-induced Hearing Loss (NIHL) which is irreversible; and,
- farmers are more likely to be exposed to mouldy dust from rotting wet grain which can result in "farmer's lung".

4.2.4 Northern and Arctic Pollution (NAP)

As for the Pregnancy and Child Development initiative, there were two components to this initiative: the MSB (Native) Component and the HPB (Non-Native) Component.

Goals/Objectives

MSB Component

The overall goal of this component was to blend community and scientific knowledge in partnerships to examine the effects of contaminants on the health and well-being of the Northern First Nations populations.

All studies under this component are based on the premise that, because of lifestyle, Aboriginals are frequently more exposed to contaminants in the environment, particularly in fish and wildlife, than is the general population.

The main activities included:

- pilot eating patterns surveys conducted in the North to develop the process for more comprehensive eating patterns surveys and provide limited data on "country foods" consumption rates; and,
- activities carried out in the regions through a number of partnerships with Aboriginal organizations.

In addition, the methylmercury work initiated under the Pregnancy and Child Development initiative is continuing on under this initiative.

HPB Component

This component involved a series of scientific studies and the goals/objectives of this component are linked to the individual studies.

The activities carried out under this component were linked to the Arctic Environmental Strategy (DIAND's Green Plan initiative). As DIAND only works North of 60, some AES activity in Northern Québec and Labrador was funded through APHE.

Accomplishments

As a result of the activities undertaken in this initiative, the following accomplishments have been identified:

MSB Component

- **Atlantic Region:** The results of the workshop (part of the larger Eco-Research project) held in 1995 in Nain, Labrador by the Labrador Inuit Association identified:
  - specific concerns: air pollution from mining dust, etc. which may lead to asthma attacks or general lung problems; incidence of cancer at Hopedale, Nain, Postville and Makkovik; and, the necessity that certain foods (pork, Black bear) be thoroughly cooked to avoid illness;
  - the importance of developing an approach to communicate concerns about perceptions of risk in a cross-cultural situation; and,
  - concerns of the north coast communities regarding development (Voisey Bay, low level military flights), sewage and water and waste management.

  In addition, the workshop resulted in recommendations on how best to involve the coastal communities in an environmental study.
- **Ontario:** The study of fuel spills in the Sioux Lookout Zone involved the Sioux Lookout First Nations Aboriginal Health Authority which developed an education strategy for the community to improve community handling and storage of fuel oil and increase knowledge of appropriate response of fuel spills.
- **Manitoba:** The Manitoba Region is working with the Manitoba Keewatinowi Okimakanak Inc. (MKO) to address MKO member First Nations' environmental health concerns. A range of environmental health issues facing the 26 MKO First Nations were identified and documented. The issues of most significance included housing, water quality, sewage disposal, garbage disposal and fuel contamination. The resulting report contains individual reports from each of the 10 MKO First Nations consulted. Recommendations of the report focused on strengthening

and developing the capacity of MKO First Nations to respond effectively to the environmental health concerns of their residents.

- **Alberta**: In Alberta, the Northern River Basin Study has funded 10 affected First Nation communities to meet and discuss traditional knowledge findings; a Human Health Monitoring Program using aboriginal communications (audio reports in Cree and Chipewyan languages on the radio); a First Nation review of the Northern River Basin Study Synthesis Report and First Nation recommendations; and, the High Level Tribal Council Environmental Health Study project design (with assistance by the University of Ottawa). The design phase of the latter project is completed.

- **Pacific Region:** There were fifteen First Nations communities supported by the Health and Evironment Aboriginal Life (H.E.A.L.) Project Committee. Projects included diet surveys, contaminant studies on traditional foods (e.g., loss of traditional sources of food), community meetings on how to deal with contaminants in traditional foods, a fish quality study, and the design of a valid and reliable food use dietary survey instrument. In addition, the H.E.A.L. Committee held an environmental health conference in 1995 in Prince George which attracted some 200 people. Although most studies are in the analysis stage, some results are available:
    - The Westbank First Nation produced a video on the use of traditional foods and plants in the area, and the impact of environmental contaminants. Areas of concern included: agricultural herbicide and pesticide use, loss of degradation of habitat, urban development, exotic species, sewage and septic tanks and contaminated sites.
    - The Diet Survey and Nutrition Workshop held by the Mowachaht/Muchalaht Band provided a venue for presenting the survey results as well as providing nutrition education for the 21 communities of the Tribal Council.
    - Results of the Carrier Sekani Tribal Council's Fish Quality Study showed the salmon had soft flesh and cancerous growths, and a second phase is being considered.
    - Some training of Natives has occurred; e.g., sample collection, etc.

Results are generally communicated through workshop reports and individual project reports. However, if during a particular study, a particular individual's sample reveals a problem (e.g., a high level of a particular contaminant and/or evidence of a health problem), they are notified immediately. Otherwise, a community owns its own data and it is up to them as to what will be done with it.

HPB Component

- **Health Hazard Assessments:** There have been 33 assessments completed, all of which have benefitted from the data and/or toxicity profiles generated by the following APHE projects.

- **Toxaphene Primate Study:** The pilot study was completed in cynomolgus monkeys, and dosing details, analytical methods, tissue sampling and other problems have been addressed. Clinical, haematological, reproductive and immunological testing has begun.

- **Human Milk, Cord Blood and Biomarker Assessment:** A contract was let to the GNWT to conduct a feasibility study for the monitoring of human milk from residents of the NWT (an analysis of 67 samples of human tissue from 41 Inuit residing in Greenland had shown high exposure levels based on TCDD toxic equivalents to be from 5 to 10 times higher than people living in more southern latitudes). Data will be compared with enzymatic biomarker parameters being carried out on liver samples (collaboration with Public Health, Québec). Consultation, training and preparation of recruitment packages and general educational materials necessary for human milk sampling in Inuit communities has been completed.

- **Yukon First Nations Assessment of Dietary Benefit and Risk:** The data has been collected and the analyses are underway.
- **Dietary Intake Studies in Northern Communities - Mackenzie Phase II:** This project has been completed as planned. Ninety-four (94) interviews were completed which yielded 206 completed questionnaires. Lab analyses of one full year of fish and caribou sampling have been completed. The analysis of the spring and summer interviews is underway, with the round of fall and winter interviews set to begin. The associated health hazard assessment of the Yellowknife/Back Bay fish contaminants data was also completed in August of 1996. It advised the GNWT Technical Committee on Arctic Contaminants (TCAC) that the levels of contaminants in fish from these waters did not pose a health hazard.
- **Toxicity Profiles:** This project initiated toxicological reviews for endrin, endosulfan, methoxychlor and tris (4-chlorophenyl) methane. Completed profiles include toxaphene, mirex, photomirex, dichlorobenzene and penta-chlorobenzene. Regulatory values (i.e., provisional tolerable daily intakes) were developed for photomirex and dichlorobenzene, revised for mirex and pentachlorobenzene, and reassessed for toxaphene. A regulatory review was conducted for chlordanes. HPB also continued its participation in the development of working guidelines for human blood contaminant guidelines used by the GNWT Cooperative Risk Management Group.
- **Human Contaminant Trends in the NWT:** A virus outbreak in early 1996 reduced the study's scope and the work could not be completed as initially planned. Methodology instruments have been completed. The 1996 milk samples currently being collected by the Keewatin Regional Health Board will be sent to HPB for contaminant analysis.

The immediate clients are the territorial governments of the Yukon and the NWT. All results are released to the governments which, in turn, provides the results to Health Canada. Then the results go back to the territorial governments and on to their respective Contaminants Committees. These committees, made up of community representatives, make decisions on how to advise communities. If a contaminant level is deemed to be high, an advisory is disseminated through the committees. For example, risk assessments were conducted on cadmium in caribou kidneys and toxaphene in burbot liver, and advisories were communicated to affected communities via the respective Contaminants Committees.

Assessment of the Initiative's Success

Overall, there is evidence that this initiative is addressing its overall goal of blending community and scientific knowledge in a partnership to examine the effects of contaminants on the health and well-being of the Northern First Nations populations. However, it is difficult to assess the extent to which the initiative is meeting its project/activity-specific goals as much of the work is in the analysis stage and the results will only be known in the long term. Nevertheless, a number of general comments can be made with regard to the initiative's success to date.

The initiative has contributed to the organization of meetings and the facilitation of dialogue on environmental health concerns in several Northern communities. Similar to the EAGLE program, this initiative was intended to provide aboriginal communities with "tools" to enable them to make decisions for themselves.

Overall, the studies under this initiative have provided preliminary baseline data and identified the need for studying the effect of an "intervention" through monitoring. In the opinion of stakeholders, this initiative has allowed them to conduct important work in the area of Arctic contaminants on two fronts; i.e., on the communications side (workshops and advisories) and on the research side (see above list of research studies).

For Health Canada in particular, the studies conducted under this initiative have enhanced HPB's Environmental Health Directorate's ability to link to other national and international programs in the Arctic (e.g., DIAND's Arctic Environmental Strategy), and raised the department's awareness of issues in the Arctic. As there are no laboratories in the Arctic to do the kind of risk assessment/analysis required, there is an important role for Health Canada in the evolution of understanding contaminants.

Different approaches were adopted to study contaminant levels in country foods based on local conditions. According to external stakeholders, the work undertaken in the respective Northern communities has led to a greater awareness of potential health risks. It was noted that Health Canada made a concerted effort to promote local community involvement in key stages of program implementation; i.e., identification of needs, project selection, communication of study results, etc. Community involvement has been seen as a positive aspect of this initiative, and there has been a steady growth in requests for support articulated at the community level. The H.E.A.L program in British Columbia, for instance, is no longer able to respond to all the demands for support.

4.3 Facilitating Individual and Community Action

There are two initiatives involved in facilitating individual and community action under APHE. These are:

- Healthy Environment Program
- Active Living Environments Program

The discussion below addresses the following evaluation questions:

Q.8 What health risks have been identified and communicated with individuals and community groups under the Initiatives?

Q.9 How has Active Living Environments Program (ALEP) encouraged Canadians to engage in more responsible, more active and healthier physical activities that are environmentally friendly? How has the program enhanced Canadians' collective capacity to create or preserve quality environments for active living? How has ALEP encouraged Canadians to address the environmentally-based health risks which the program has targeted, namely UV rays, pesticides, recreational water and air pollution?

Q.10 How many and what kinds of workshops, educational, and other promotional events have been held or supported under the Initiatives? How many and what kinds of people have these events reached? Have these events contributed to their participants' knowledge about health and the environment? In what ways have these events increased the ability of communities, groups and individuals to manage health risks in their environments?

Q.11 How many and what kinds of community demonstration projects have been funded under the Initiatives? What have the evaluations of these projects shown? How have the results of these demonstration projects been shared and used? How have community groups' and organizations' ability to help Canadians manage health risks in the environment been strengthened because of project funding under the Initiatives?

Q.12 What has been the Department's success in developing partnerships with Aboriginal Canadians, with professional organizations, with voluntary health and social groups, and with the private sector, to increase individual and community action on health, environment and sustainable development issues?

- *a. How many communities participated in the activities of the Initiative?*
- *b. How many communities succeeded in meeting objectives they had set for themselves with the Initiative? What actions were taken by these communities on health, environmental or sustainable development issues, and what were results of these actions?*

These initiatives were intended to increase the capacity of communities and individuals to become involved in fostering changes with respect to health and the environment. In its 1992 planning documents, Health Canada indicated its intention to play a facilitative role through public awareness initiatives and community funding. This would make health and environment information more accessible to Canadians, and enable the public to adopt healthy environmental practices.

In particular, Health Canada would provide assistance in communicating and interpreting scientific information to promote a positive climate with regard to health and the environment, and mobilize change at the community level.

Sections 4.3.1 and 4.3.2 below summarize the specific results achieved by each of the two initiatives as well as the study team's assessment of each initiative's success in meeting its goals/objectives under APHE. More details on these initiatives are provided in Appendix B.

4.3.1 Healthy Environment Program (HEP)

Goals/Objectives

The Healthy Environment Program (HEP) emphasizes and establishes the basic ideas of health promotion as the foundation for helping Canadians to adopt behaviours that improve environmental conditions for better health.

The objectives of the HEP were to:

- increase awareness of environmental health issues;
- promote the involvement of individual Canadians in a healthy environment;
- make it easier for Canadians to understand their own capacity to influence their health and the environment in which they live; and,
- increase and strengthen partnerships and collaborative efforts with others who share our goals.

There were three activity areas:

1. Grants and Contributions Projects

There were a total of 27 projects funded through grants or contributions, each with their own goals and objectives. Projects explored both the broader issues of healthy communities/environmental citizenship and the more specific issues surrounding health and the environment such as UV radiation and air quality. (Responsibility for the Grants and Contributions is now with the Healthy Living and Environments Division.)

2. Community Animation Program(CAP)

The Community Animation Program (CAP) is a national partnership between Health Canada and Environment Canada that supports communities working on health and environmental issues. The way CAP is managed varies from region to region.

There were two parts to CAP. CAP I was a six-month pilot project for the current CAP (or CAP II) initiated in the fall of 1993 and running until the spring of 1994. It was conceived and funded by Health Canada. Four pilot regions were selected for CAP I: British Columbia, Saskatchewan, Quebec and Nova Scotia.

In December of 1994, CAP II was launched and was designed to run until March 31st 1997. CAP II was intended to contribute to sustainable community development in Canada. Its two objectives are: to increase the capacity of communities to take action on issues related to health and the environment; and, to enable communities to access available expertise/knowledge existing in federal departments, provincial and municipal governments, associations and NGOs.

The implementation of CAP II is directed at the regional level in six regions: British Columbia/Yukon; Alberta/Northwest Territories; Saskatchewan/Manitoba; Ontario; Quebec; and, the Atlantic Provinces.

3. Social Marketing

Under HEP, a number of social marketing activities were undertaken to motivate behavioural change through localized efforts as well as national efforts (e.g., use of television).

Accomplishments

As a result of the activities undertaken by HEP, the following has occurred:

- **Grants and Contributions Projects:** As a result of these projects, a number of tools have been produced to help create awareness and to promote involvement of individual Canadians in a healthy environment. These included workshops, guide books, surveys, videos, ad campaigns and the development of a software program.
- **Community Animation Program:**

CAP I:

- In BC, the CAP pilot made start up money and strategic resources available to communities that wanted to deal with health and environment issues.
- In Saskatchewan, the Saskatchewan Environmental Society invited 28 environmental organizations to consider how CAP could assist the work they did. A total of 23 projects were funded.
- In Quebec, the Union québeçoise pour la conservation de la nature (UQCN) sought to: increase the awareness in four communities on the link between health and the environment; help create linkages between representatives involved in the health and environment sectors in each of the pilot communities; foster a discussion in each community to identify the needs with respect to health and the environment; and, identify priorities for action which could take place in each of the communities.
- In Nova Scotia, the Clean Nova Scotia Foundation developed the Restoring Environmental and Community Health (REACH) which aimed at supporting communities to take action on issues relating to health and the environment. Nine community groups were supported.

CAP II:

CAP II is really just getting underway and it is too early to assess the accomplishments. However, a number of strong partnerships have already been developed, most importantly the one between Health Canada and Environment Canada. Environment Canada is now contributing 50% to CAP.

A number of activities are underway in the six regions including:

Atlantic Canada: To date there are approximately 50 communities working with CAP Atlantic from all four provinces.

In addition, there is a Resource Centre which provides community groups and citizens with access to research material.

Quebec: Currently, CAP is supporting activities in six low-income communities in three different geographic areas: rural; semi-urban; and, urban.

Ontario: There are currently CAP projects underway in ten communities; e.g.:

- promotion of responsible septic maintenance, conservation of water resources and educating rural residents on the links between the use of their septic system and well water, as well as broader ecosystem impacts (West Garafraxa Township);
- promotion of food security initiatives such as food cooperatives, nutrition, organic growing, low transportation food distribution networks, etc. (Peterborough); and,
- training ambassadors to engage in outreach activities within the Toronto Chinese community.

Manitoba/Saskatchewan: CAP II is well underway in both Manitoba and Saskatchewan at this time. The Manitoba and Saskatchewan CAP II contracts focus on linking various key players and stakeholders, from various disciplines, in order to facilitate action that grows out of health determinants interaction.

Alberta and the Northwest Territories: Alberta has eleven initiatives in progress covering a wide variety of issues, including: recycling; air and water quality; education and training programs; creating networks; preparing booklets; and, establishing a library.

British Columbia/Yukon: This region also has 9 initiatives underway. The primary focus is creating networks, conducting conferences, and education.

In addition, an Evaluation Framework for CAP (II) [15] has been prepared.

- **Social Marketing:** A small sample of the activities to date includes:
  - dissemination of Healthy Environment messages through the CBC programs "ALIVE" and Street Cents;
  - input on health/environment messages specific to UV radiation and indoor air quality for the Earth Day Special held on April 22, 1995;
  - input to the french television show "Salut Bonjour" - a regular half-hour program on Radio-Canada that tries to inform viewers of recent prevention or treatment methods to combat health programs;
  - preparation of the "Teacher's Guide", an extension of the Street Cents video, which is targeted to students in grades 7-11;
  - production of "The Healthy Environment Program", a series of 60-second vignettes on health and the environment to be aired hourly on the Weather Network and its French affiliate Meteomedia. A winter series and summer series were implemented;
  - an Envirodollars Project (conducted in July and August of 1996). Passengers using the London, Ontario transit system were to receive Envirodollars (discounts at participating retailers) if they bought passes for July in June; and,
  - translation into French of the Green Games Guide, which outlines how to incorporate environmental considerations into the planning of any sporting event.

Assessment of the Initiative's Success

At the time of this study, there was insufficient performance information on the program to permit us to objectively evaluate the success of the program. Performance information for this type of program should ensure adequate assessment of the changes in behaviour in the target populations with respect to specific objectives for increased awareness, attitudinal change, as well as behavioural change. Impacts must be measured by quantitative survey research using an appropriate methodology.

From the above, it is evident that HEP activities have promoted the involvement of individual Canadians and communities in a healthy environment, and have been instrumental in bringing together various groups in partnership to collaborate on issues that they share. However, it is too early to assess the extent to which the initiative has been successful in increasing awareness of environmental health issues and making it easier for Canadians to understand their own capacity to influence their health and the environment in which they live.

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[15] An Evaluation Framework Study and Tools for the Community Animation Program, Goss Gilroy Inc., December 1995.

All grants and contribution projects were completed as contracted. All projects have resulted in the production of a tool (video, workshop, guidebook, etc.) which will be used to increase awareness, build capacity at both the individual and community level, and promote behavioural change with regard to addressing the health impacts of respective environments.

CAP has had some success in reaching out to Canadian communities. While the initial target for CAP activities was 100 communities, to date, some 150-200 communities have participated in CAP. In the opinion of interviewees, the CAP has:

- has provided enabling strategies for communities to address environmental health issues;
- stimulated the growth of networking between community groups to address common issues of concern; and,
- created a number of successful partnerships, both nationally and regionally.

In addition, it is felt that some awareness has been created as a result of the social marketing activities.

4.3.2 Active Living Environments Program (ALEP)

Goals/Objectives

The goals of this initiative were to support and encourage Canadians to engage in more responsible, more active and healthier outdoor physical activities that are environmentally friendly, and to enhance their collective capacity to preserve or create healthier environments for active living. In addition, ALEP encourages Canadians to address environmentally-based health risks, in particular:

- *air pollution,* by focusing on transportation to reduce car use and promoting biking and walking;
- *recreational water pollution,* to influence individuals and communities to address barriers to recreational water quality;
- *sun,* by connecting with HPB to provide information and tips on sun safety to stakeholders/educators and to mobilize recreational leaders to take policy and program action regarding sun exposure; e.g., creating "shade" in playgrounds; and,
- *pesticides,* by focusing on home gardeners and parks and recreation staff to encourage naturalization of backyards and parks.

The *Active Living - Go For Green!* program was initiated at the federal level in 1991, sponsored by Fitness Canada, as part of the National Health and Welfare Plan on Health and the Environment under the federal government's Green Plan. The four main objectives were partnership building, environmental experience, safe/accessible environments, and active transportation. Achievement of these objectives has been sought at the local level through community-based projects as well as through application of a number of strategic approaches at the national level. National projects were managed directly by Health Canada and the *Active Living - Go for Green!* office. Regional/community projects were managed by the *Active Living - Go for Green!* office in concert with provincial/territorial governments.

National projects were generally supported by in-kind contributions, while local activities were supported by grants. Projects were funded through block funding agreements with the provinces/territories (usually with the Ministries of Tourism and Recreation) according to a number of commonly held core national/regional criteria; i.e., projects had to demonstrate that they:

- were community-based;
- were capable of reaching a large number of people;
- involved public participation in planning and implementation stages;
- were part of existing municipal-wide strategy (e.g., Recreation Master Plan, etc.);
- demonstrated collaboration, intersectoral cooperation (recreation, education, environmental, health, tourism, etc.);
- were relevant to one or more of the four ALEP objectives;
- demonstrated sustained impact beyond 1997 (commitment, responsibility); and,
- demonstrated a willingness to communicate the content and success of the project to other communities in Canada.

Accomplishments

According to a recent evaluation [16] of the ALEP, the following has occurred as a result of initiative activities:

- Provincial/territorial funding agreements have been established.
- Provincial/territorial Go For Green Networks (i.e., provincial and community organizations) have been established. According to the 1994-95 evaluation, there were 500 such networks.
- Canadian communities are actively engaged in Go For Green activities and registered. According to the 1994-95 evaluation, 700 communities were actively engaged in such projects.
- Local leaders (municipal officials, business leaders, etc.) are known to be committed to the continuation of Go For Green principles as is evident through local policies and programs (improved walking in winter, bicycle lanes, improved safety/accessibility in parks). According to the 1994-95 evaluation study, there were 3,500 such leaders.
- Canadians are being informed of the benefits of certain actions relative to active living, health and environmental citizenship. In the 1994-95 evaluation report, it was estimated that some two million Canadians have been reached by Go For Green messages.

The initiative has made significant progress towards partner network development at the national level. For example:

- a database for use by leaders at all levels (Partners) is under development and will contain information on all Active Living - *Go For Green!* community projects from across Canada. In addition, this information will be made available on the Internet;
- a fundraising strategy to assist partners to leverage funds from non-government sources up to and beyond 1997 has been developed. Eleven possible methods of fund raising were identified and discussed. An action plan has been developed to determine the viability and potential for the success of each method; and,

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[16] Active Living - *Go For Green!*, 1994-95 Evaluation Study Report (Draft), Dr. G. Hanna, University of Alberta, May 1996

- a working group has been struck to examine all possible ways to assist communities to measure the impacts of their local Active Living - *Go for Green!* actions. The group plans to look at participation, economic, health, policy and a wide range of other indicators.

There is also evidence that a number of ALEP activities have identified and communicated the health risks identified by Health Canada as part of the Initiative's goal. Most of the stakeholders interviewed, indicated that their projects had identified and communicated a number of health risks. These included:

- physical inactivity;
- air and water quality;
- exposure to UV radiation;
- exposure to pesticides; and,
- exposure to toxic waste.

Assessment of the Initiative's Success

Although ALEP has made considerable efforts to evaluate the results of the initiative annually, the information available at this time is insufficient to fully evaluate the success of the program. The results indicators for this type of program should include the target populations to be reached with respect to specific objectives for increased awareness, attitudinal change, as well as behavioural change. In addition, program management, using a population health approach, is trying to affect the physical and cultural conditions and the culture within which people live that enables them to make certain decisions. ALEP management reported the availability of over 40 indicators to assess such things as the number and nature of strategic alliances around an issue, the number and nature of bureaucratic and administerial commitments, and the degree to which a group or government body leveraged funds for an issue.

There is evidence to indicate that this initiative is addressing its goal; i.e., project activities have supported and encouraged Canadians to engage in more responsible, more active and healthier outdoor physical activities that are environmentally friendly, and enhanced their collective capacity to preserve or create healthier environments for active living.

For example, in 1994-95, there were 201 Active Living - *Go For Green!* projects funded at the Provincial/Territorial level. The vast majority of these projects (76%) were directed toward the general public. Eighteen percent (18%) were targeted toward youth, while the remainder (6%) were designed for the disabled, seniors and families. The most popular activities supported under this initiative were:

- **Walking/hiking:** Sixty projects were directed toward trail clearing and development, or the installation of signage and benches.
- **Cycling:** Most of the 30 projects were focused on the safety/accessibility aspect of cycling - trail development and the installation of signage.
- **Cross-country Skiing:** The 27 projects funded were primarily involved in the development of multi-purpose trails which could be used by walkers all year, cyclists in the spring, summer, and fall, and cross-country skiers in the winter.

- **Education and Interpretation:** Forty-four projects focused on education or interpretation of the environment. Some of the projects focused on specific education, while the remainder were associated with trail improvement, installation of signage, and brochure and program development.

Of the 56 national projects that took place in 1994-95, 48 (or 86%) were directed toward the general public. The remaining projects were directed at specific population groups (youth, seniors, women and the disabled). Twenty-four (24) of these projects focused on participation/education, 19 focused on partnership building, 10 focused on active transportation, and 3 focused on safety/ accessibility.

According to Health Canada interviewees, ALEP activities have, overall:

- permitted the application of social marketing techniques;
- has permitted the establishment of networks;
- resulted in increased knowledge and also in increased linkage of issues such as environment and health, and transportation and reduced pollution; and,
- resulted in an increased focus on activity and active transportation.

This was generally supported by interviews with stakeholders. Based on the evaluation study and interviews, it is apparent that: different levels of government are working together; more individuals are participating in outdoor activities; partnerships have been developed between the provincial governments, communities and NGOs; and, communities are taking ownership of active living in their environments through policy and infrastructure development. However, a small number of them indicated that more work was needed in the area of public education. In their opinion, a good foundation has been laid but attitudes of the public regarding health and the environment are only beginning to change. This needs to be strengthened with more ALEP-type projects.

4.4 International Liaison

The International Initiative was the only initiative supported in this component of APHE. The discussion below addresses the following evaluation question:

Q.14 What have been the activities and results of the International Initiative?

Goals/Objectives

The overall goal of this initiative was to support Health Canada's involvement in international initiatives to reduce environmental risks to the health of Canadians and the citizens of other countries.

Four projects were partially funded through APHE contributions under this initiative. These were:

1. Hazardous Waste and Health Protection in Latin America and the Caribbean: This project involved the participation of the World Health Organization (WHO), the Pan American Health Organization (PAHO), and the Environmental Health Directorate at HPB. It was executed through the Regional Program on Hazardous Waste Control of PAHO. The project consisted of carrying out a survey of hazardous waste production arising from ten different industries, including health care facilities, judged to be the largest producers of hazardous waste. This survey was conducted in twenty-one Latin American and Caribbean countries. The study included the analysis of data on quantities of hazardous waste produced, their effluent treatment

and hazardous waste disposal practices, as well as information on institutional and legislative aspects of national hazardous waste control activities in the region.

2. Assessment of Environmental Monitoring in Estonia: This project was carried out in collaboration with Estonia. It was administered by WHO-EURO which consisted of an assessment of the institutional structures and technical procedures for environmental monitoring in Estonia and included an evaluation of the quality of existing health data, the quality of lab methodology and availability and quality of referencing standards.

3. Latin America Household Water Filtration Project: This project was carried out by the International Development Division of the University of Calgary in collaboration with PAHO in Nicaragua and Honduras.

   This project was the second phase of an initial project which developed and installed intermittentently operated slow sand filters (IOSSF) in four households in a Nicaraguan community. The importance of these filters is to provide communities with clean water free of cholera. The pilot had demonstrated clear health benefits from this technology - the site of the pilot was the only cholera-free rural community in Nicaragua.

   The specific objectives of this project were as follows:

   - to evaluate the technical performance of IOSSF technology in rural communities in Nicaragua;
   - to evaluate community acceptance of IOSSF technology;
   - to evaluate the impact of IOSSF technology on community health and quality of life;
   - to formulate, based on the above, recommendations regarding the use of IOSSF technology in rural communities in Nicaragua;
   - to train Nicaraguan professionals and technicians in IOSSF technology and technical development methods; and,
   - to strengthen Nicaraguan and Canadian universities in their capacity to investigate, evaluate and teach water and sanitation technology.

4. Emerging Diseases: This project was carried out in coordination with Health Canada's Laboratory Centre for Disease Control in partnership with WHO in Geneva and PAHO in Washington. (At the time of this report, external contacts have failed to supply documents on the activities and hence results of this project.)

Accomplishments

As a result of the four projects carried out in the International initiative, the following has occurred:

1. Hazardous Waste and Health Protection in Latin America and the Caribbean

   The project has been completed as contracted and a report, "*Hazardous Waste and Health in Latin America and the Caribbean*", PAHO, Washington, D.C., 1994., has been produced. This report has become a part of PAHO's series of publications which call attention to environmental health problems. Due to high demand, it is now in its third edition and has become a tool for decision-makers in government.

   The results of this project generated hard data which can be used for health interventions and have led to other spin-off activity including:

- specific projects conducted by a German CIDA-like organization; e.g., a guideline for classification of waste according to health risk is being produced which has never done before;
- established a network among the different institutions in the 10 countries surveyed to assist in the management of hazardous waste in a safe and healthy way; and,
- training by the U.S. Environmental Protection Agency (EPA) in hazardous waste management using PAHO's infrastructure.

2. Assessment of Environmental Monitoring in Estonia

The project was completed as contracted and there were three reports produced:

- "*Assessment of Environmental Monitoring in Estonia*", Agreement Report, August 1993;
- WHO Mission Report, "*Assessment of Environmental Monitoring in Estonia*", June 1993; and,
- "*Environmental Health Services in Europe Survey on Environmental Health Services in Estonia*", Sept. 1993.

Although the project concluded that the environmental monitoring data generated by the former U.S.S.R were unreliable and incomplete, interviewees felt that the information gathered was valuable. In their opinion, the activities of the project have:

- created awareness on the part of the Estonians on Western procedures which have led to improvements in their methods; and,
- provided basic monitoring equipment to Estonian government counterparts.

In addition, the experience led to funds from Foreign Affairs to help train Estonians in environmental monitoring techniques.

3. Latin America Household Water Filtration Project

The project has been completed as contracted and a report is pending.

To date, the project has resulted in:

- the setting up of two factories in Nicaragua to manufacture these filters;
- the training of a number of Nicaraguan locals in the technology;
- moral support from the Nicaraguan Minister of Health; and,
- a number of spin-offs for the contractor including:
    - a working relationship with the International Development Research Centre (IDRC) and Samaritan's Purse (a Calgary-based NGO) to pursue a national project in Nicaragua;
    - installation of seven of these filters on the Bonaparte First Nation Reserve (British Columbia) in January of 1996;
    - a pilot project for Agriculture Canada (potential for use of these filters by farmers);
    - interest from Chile; and,
    - orders from cottagers/farmers for these filters.

4. Emerging Diseases: (not yet available at the time of writing this report).

Assessment of the Initiative's Success

From the study team's point of view, the projects were completed as contracted and the overall goal of the initiative has been met; i.e., Canada became involved in international initiatives to reduce environmental risks to the health of Canadians (e.g., water filtration technology) and the citizens of other countries (Estonia, Latin America and the Caribbean).

In the opinion of Health Canada interviewees, the activities of the International initiative have, overall, initiated and supported international interest for Canadian technical knowledge and ability to address health/environmental issues. Good networking relationships with individuals in PAHO and WHO have been established and interest in action to reduce risk to health from environmental causes has been stimulated. In their opinion, there has been a relatively positive influence with small amounts of money.

From the point of view of stakeholder interviews, the projects have generally contributed to a movement (in those countries in which there were projects) towards a more adequate management of environmental risks to health. For example, the results of the Estonian project are being used to improve quality control and lab methodologies in that country. This transfer of knowledge will be a good starting point for countries which were former members of the USSR.

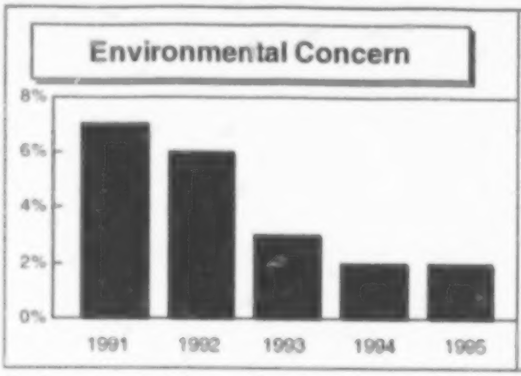
The main problems encountered during this project were mainly those often encountered when doing a project with a partner in another country. For example:

- during the Hazardous Waste Project, there was a problem for PAHO in identifying the focal person in each of the countries surveyed as it was all done from a distance; i.e., fax, letter or telephone;
- the nature of Estonian politics and the bureaucracy involved in transferring the funds to WHO-Euro for the Estonian project resulted in delayed reporting; and,
- the contractor who carried out the water filtration project found the partnership with PAHO not as advantageous as it could have been. A major water disinfection program initiated by PAHO at the outset of this project resulted in deflecting a lot of local interest/support away and the contractor ended up working directly for the Nicaraguan Minister of Health.

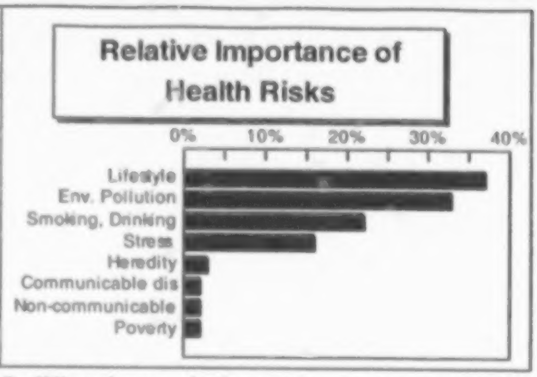
4.5 Impact of Public Communications - Trends in Public Concerns on Health and the Environment

The discussion below addresses the following evaluation question:

Q.13 ***During the period covered by the activities of APHE, have Canadians become more aware and better informed of health risks in their environment and of how to reduce or manage these risks? What evidence is available on changes in the behaviour of Canadians that can reduce or manage the health risks in their environment?***



Q -In your opinion, what is the most importa problem facing Canadians today?



Q -What do you feel are the most important risk factors in determining your overall state of health?

The discussion below is derived from our review of available and pertinent public opinion surveys contained in Government of Canada (*Focus Canada*, *Environmental Monitor*, and the *Reid Report*) and Health Canada publications. Public opinion information was available from the *Environmental Monitor* for 1992 to 1996.

4.5.1 Awareness of Canadians of Health Risks in Their Environment

The physical environment in which we live is an important element to health and is recognized as a significant concern by Canadians. In recent years, concern for the environment has declined. As shown in Figure 1 below, the environment was rated, in 1991, by 7% of the respondents as the most important problem facing Canadians today. By 1995, this concern had decreased to 2%. Other issues such as unemployment, the economy, and the deficit have increased in concern(Table 2 below).

Figure 1: Environmental Concern

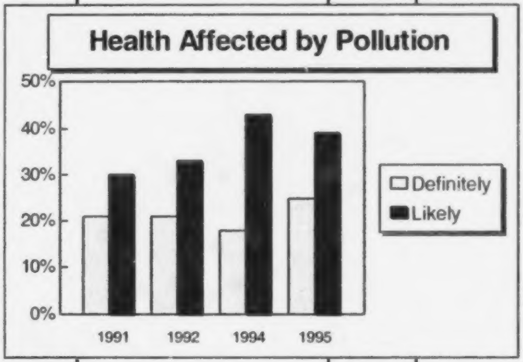
Figure 2: Importance of Health Risks

Although it is not perceived to be the most important problem facing Canadians today, a large majority feel that their health is being affected, to at least some degree by many types of environmental issues.[17] When asked to rank the most important factors affecting their overall state of health, in 1993, the environment ranked second to lifestyle in its perceived importance to human health.[18] (Figure 2 above).

In spite of a decline since 1991 in the percentage of Canadians who rated the environment as the number one concern (see Table 2 below), there has been a steady increase in the proportion of respondents who believe that their health is affected by environmental pollution. (Figure 3 below).

Table 2: Relative Importance of Issues of Environmental Concern

1991		**1993**		**1995**	
Unemployment	21%	Unemployment	37%	Unemployment	36%
Economy	18%	Economy	24%	Economy	18%
Taxes	9%	Deficit	9%	Deficit	11%
National Unity	8%	Leadership	7%	National Unity	4%
Environment	**7%**	Taxes	6%	Taxes	4%
		Environment	**3%**	Leadership	4%
				Crime	4%
				Social Issues	3%
				Environment	**2%**



Q -To the best of your knowledge, would you say your health has been affected by pollution over the past few years?

Figure 3: Health Affected by Pollution

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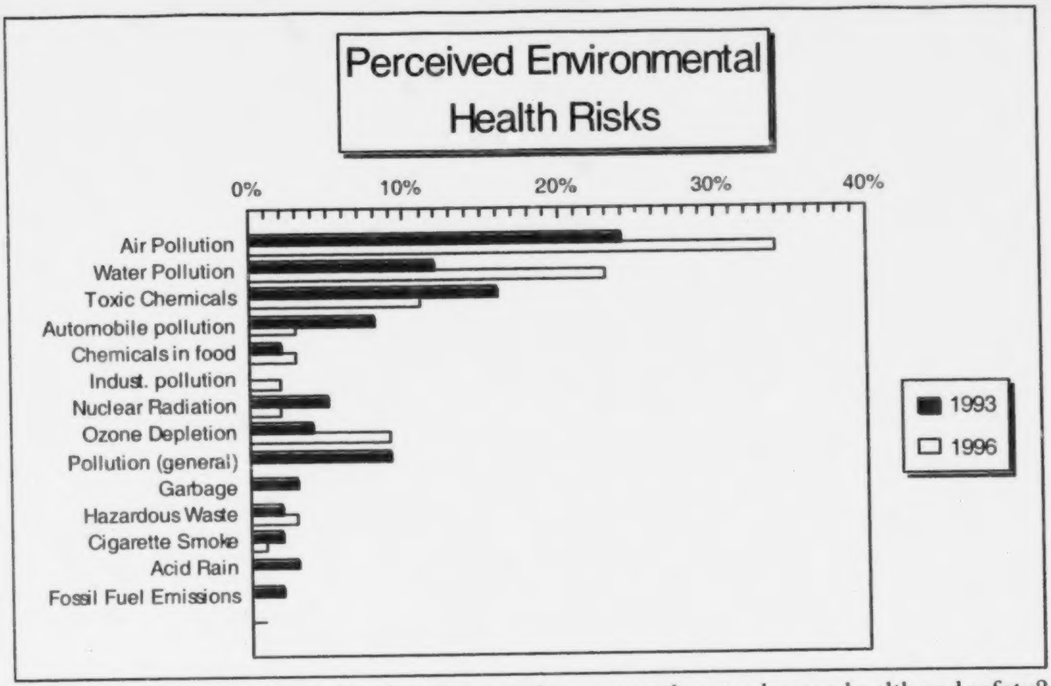
[17] Focus Canada (June 1995)

[18] Environmental Monitor 1993-94, Report Card.89



Q - In your view what kind of pollution poses the greatest threat to human health and safety?

More than half of Canadians continue to believe that their health has likely been or definitely been affected by pollution in general. [19]

However, health risks perceived by the government may or may not be perceived by Canadians. Several public opinion surveys such as The *Decima Quarterly Report*, *Focus Canada* and The *Environmental Monitor* track Canadian environmental priorities. According to recent surveys, Canadians are concerned about a wide range of environmental issues which are perceived to be a threat to health. These are illustrated in Figure 4 below. However, according to the literature, the perception of risk is influenced by the number of times a person hears about a particular hazard. Perception of risk by the public is equated with the probability of being exposed to that risk. Perception is also strongly influenced by the degree the hazard is understood, the degree the hazard invokes a feeling of dread, and the number of people exposed to the hazard. [20]

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[19] Environmental Monitor 1995-4

[20] Health Risk Determination (1993)

Significant Variations

The *Environmental Monitor* has been monitoring Canadians' views, attitudes, and behaviours regarding the environment on a quarterly basis. When asked to describe their perceptions of the most serious environmental problems, there was a consistently high degree of concern for air quality. (See Figures 4 and 5 below).

- Air Pollution - Deterioration of air quality is increasingly viewed as being the greatest threat to human health and safety. Air pollution is perceived by over one third (34%) of participants as being the main environmental risk to health, up from 24% in 1993. Contaminants in the air, indoors and outdoors, are the most common forms of pollution.

Humans are exposed to contamination through inhalation of air itself, deposits on food, soil, and water. Although Canada has made substantial improvements in respect to emission reductions of pollutants such as lead and sulphur dioxide, many issues exist that must be addressed such as the health effects of gaseous agents on ground level ozone, nitrogen oxides, carbon monoxide/dioxide and methane. As well, all effects of contaminants are not known. For example, the effects of long-term exposure to ambient air pollution needs to be determined. Exposure guidelines are needed with respect to bacteria, allergens, etc.

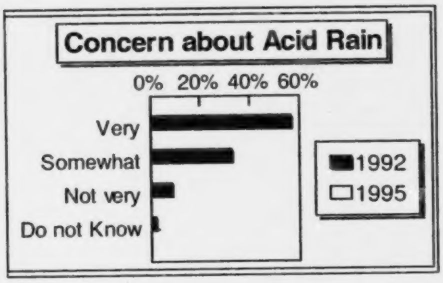
Figure 4: Perceived Environmental Health Risks

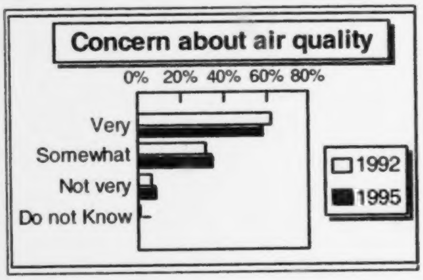
Interestingly, a comparison of the 1996 findings with those from 1993 reveals that Canadians associate less risk with 8 of the 14 environmental problems previously examined. However water pollution, chemicals in food, and industrial manufacturing pollution have risen in concern:

- Water Pollution - According to the draft report entitled 'Human Health and the Physical Environment', although we now have the ability to detect very small levels of environmental pollutants and although the overall quality of drinking water is very high in Canada, there is a perceived need for improvement. Pesticides, radioactive substances, aluminum, and other metals which are found in most water supplies in Canada at very low levels rarely pose any health risks. In heavy concentration, however, these contaminants may pose a variety of risks to human health. According to the public opinion surveys, 23% of study participants perceived the pollution of water (which includes the contamination of oceans, lakes, and rivers), as being the second worst environmental risk to health in 1996, up from 12% in 1993.
- Industrial Manufacturing Pollution -Not ranked as an environmental health issue in 1993, pollution emanating from industries is ranked number six as a perceived health risk in 1996.

- **Chemicals in food - The perceived health risk of chemicals in food has increased considerably. Although Canada's food supply is one of the safest in the world, contamination does exist. It occurs through natural contaminants, microbial means and chemical means. Food additives, pesticides, PCBs and various metals are the agents that may cause harmful effects to human health.**

Figure 5: Other Concerns About the Environment





Concern for other environmental issues has declined:

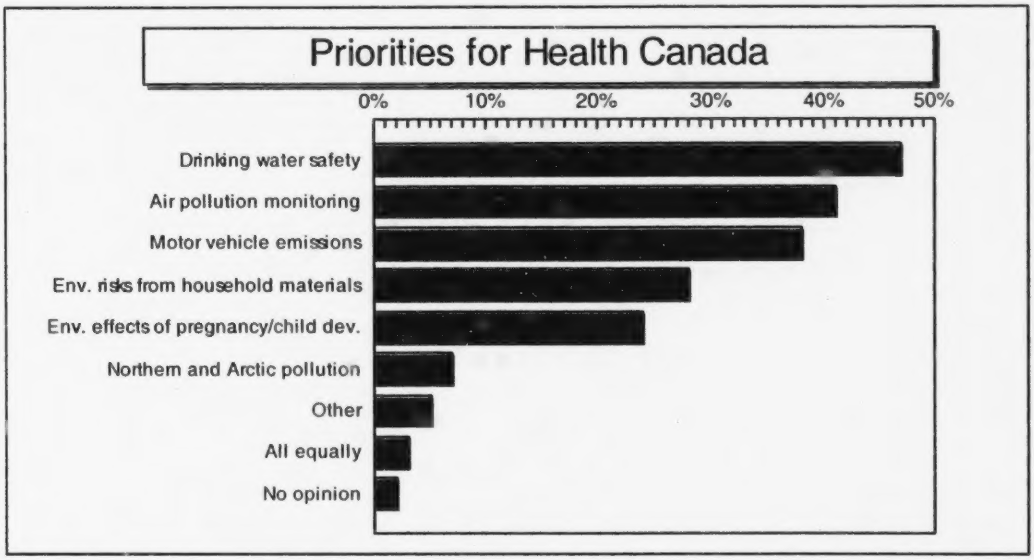
- **Acid rain - Although acid rain ranked as being a great environmental concern in 1992 (57%) it has dropped considerably as a perceived health risk (0%) in 1995.**
- **Other - The concern for toxic chemicals, automobile pollution, garbage, and nuclear radiation has declined since the late 1980's.**

4.5.2 Steps to Reduce Health Risks

In 1996, three quarters of respondents reported that they are taking some measures to reduce environmental risks to their health. As illustrated in Figure 6 below, recycling, sorting, and

Figure 6: Steps Taken to Reduce Health Risks

re-using garbage, quitting smoking, using environmentally-friendly products, and driving less



were the most commonly mentioned steps. Nineteen (19%) per cent of respondents; however, have not taken any measures at all and 6 per cent have no opinion.

Government Performance and Awareness of APHE

Although the public opinion surveys in the past did not specifically address whether or not Canadians realize what the various levels of government are doing regarding the protection of the environment, *The Environmental Monitor* did ask participants to rate their performance in general. In 1995, 22% rated the Federal Governments' performance as being at least good, an increase from 14% in 1992.

In 1996, Canadians were asked, for the first time, specific questions regarding Health Canada initiatives and APHE. When asked if they had seen, read, or heard of any publication or actions taken by Health Canada dealing with environmental health risks, only 5% of respondents answered "yes". Seventy-six (76%) per cent reported that they were not aware of any initiatives and 19% had no opinion. When prompted, however, it was found that there is indeed a high level of awareness. After they were told that Health Canada had initiated the

Action Plan on Health and the Environment respondents indicated that they were aware of specific initiatives. Many respondents (61%) reported that they were aware of initiatives dealing with environmental risks from household materials and toxic chemicals, that they were aware of initiatives dealing with motor vehicle emissions (57%), and air pollution monitoring (46%). In this case, 14% had no opinion and 4% were not aware of any initiatives.

Survey Respondents Views of the Priorities for Health Canada

Respondents were asked which areas they feel should be of top priority for Health Canada. As shown in Figure 7 below, drinking water safety (47%), air pollution monitoring (41%), and motor vehicle emissions (38%) were regarded as being the top environmental priorities.

Figure 7: Priorities for Health Canada

4.5.3 Assessment of APHE's Success in Informing Canadians of Health Risks

Although a number of initiatives intended to provide information to the public to better inform them of health risks in their environment, most of the information generated to date has been directed to the scientific community through journal publications, scientific conferences and presentations. However, there is some evidence in our findings that APHE activity has contributed to increased public awareness on environmental health risks. For example:

- an 8-page (*Enjoying the Sun Safely*)Health Canada insert in the June 1995 issue of Reader's Digest reached millions of readers (Solar UV activity within the ERR initiative);
- an increased level of general awareness of health issues in the St. Lawrence River Basin area as a result of the SLHEP community -based activities;
- increased public awareness of potential health problems related to a poor quality community water systems (DWSPNP);
- increase in understanding throughout the Great Lakes Basin about how environmental contaminants affect First Nations health and well being (EAGLE);
- increased awareness of health/safety risks associated with farming as a result of the Farm Family Newsletter which publishes the results of the Farm Health Study (PCD initiative);
- results of workshops and community meetings (NAP); and,
- the community-based and social marketing activities of HEP and ALEP.

In addition, there is some evidence available to indicate that APHE activity has resulted in encouraging Canadians to reduce environmental risks to their health. For example:

- the public education and training activities of the DWSPNP have been attributed to a reduction in incidences of water-induced illnesses in a small number of project catchment areas;

- the results of the Farm Health Study indicates that some progress as been made with the rural community with regards to managing the risk of exposure to pesticides by wearing protective clothing; and,
- the results ALEP activities indicate that more Canadians are participating in outdoor activities and that a number of communities have taken steps to address risks in their environments through policies and infrastructure development (e.g., improved safety/accessibility in parks, bicycle lanes, cleaner sidewalks in winter, etc.).

5.0 Continued Relevance of APHE Activities

The discussion below addresses the following evaluation question:

> *Q.15 Are there activities under specific APHE Initiatives which should continue to be carried out after 1996/97? What would be the consequences of no longer carrying out these particular activities? How much of the funding and programming of these activities is it essential that Health Canada provide?*

5.1 Need for Continuation of APHE After 1996/97

In terms of the continued relevance of APHE activities, comments can be made at both the general level and at the initiative-specific level. In general, results of discussion groups and interviews indicated that there is strong support for the continuation of many of APHE activities as most are considered to be valid risk assessment activities. In addition, it is considered to be particularly important to ensure sustainability of those initiatives already undertaken, such as databases. Otherwise, investments made under APHE may be wasted.

Interviews with Senior Health Canada managers indicated the following priorities:

- continuation of mandatory programs such as CEPA;
- continuation of basic monitoring of health effects from potential environmental hazards (as carried out by LCDC);
- continued monitoring of contaminants in the food supply and issues of water quality for First Nation peoples because of their traditional lifestyle and, hence, greater exposure to contaminants in the food chain and the subsequent impact on health and well-being of First Nation communities; and,
- continuation of basic monitoring activities related to other groups at risk such as children and pregnant women.

There was a belief on the part of some of the interviewees that emphasis should shift from risk assessment to risk management and communication. This is based on the fact that, although much risk assessment activity has taken place during APHE, overall, delineation of risk management strategies and options, as well as appropriate risk communications, were on a much smaller scale and varied from initiative to initiative.

Some stakeholders were of the opinion that in the future, Health Canada should tie risk assessment activity to demonstrable health impacts; i.e., focus activities on areas where reductions in morbidity and mortality can be demonstrated. Discussions with Health Canada managers indicated that, in the future, cost benefit analyses will be increasingly needed to make arguments with regard to funding levels. Further, health economics studies are likely to become increasingly important to help sell programs at the political level.

An important problem encountered in determining the continued relevance of APHE activities derives from the fact that APHE funds have been used to supplement/supplant A-Base money. From this point of view APHE funds have been used to carry out essential ongoing Health

Canada activities. From this perspective, many of the activities that APHE is currently funding will have to continue under one form or another after 1996-97.

5.2 Initiative-Specific Activity Which Should Continue and Consequences If Not Continued

The section below provides a detailed analysis by initiative concerning activities which should be continued and the consequences of not continuing these activities. This analysis is based on the opinions of Health Canada managers and initiative stakeholders and is summarized in Table 3 at the end of this chapter. From the information below, we concluded that the following priorities exist for continuation of APHE activities:

- APHE activities that are required under legislation, such as CEPA, must continue in order that the department fulfills its mandate;
- APHE activities involving research studies that are partially complete should continue to ensure the investment already made is not lost;
- Periodic updating and maintenance of databases established under APHE should continue to ensure the safeguarding of the investment;
- environmental health programs directed towards Native people;
- Dissemination of all APHE outputs (reports, studies, information) should be ensured in order to maximize the benefits to the public at large and to the scientific community; and,
- Development of risk management strategies (e.g., prevention strategies and information programs) to complement the risk assessment work carried out previously under APHE should be a Health Canada priority.

The results of our evaluation would indicate that less funding may be required in areas where initiative objectives have been largely achieved (e.g., DWSI) and where initiative activities were a one-time event (e.g., updating the National Calibration Reference Centres and the Chronic Uranium Uptake Study under ERR and workshops held under NAP). It was also noted that ALEP funding requirements are now lower than during APHE as it appears that many of the users of ALEP funding, who were interviewed, indicated that their projects are now sustainable. The International Liaison program should be considered as an international commitment on the part of Health Canada and not strictly a part of the Canadian Action Plan on Health and the Environment.

At this point, it would be useful for the federal and provincial governments to jointly review the completed APHE activities as part of a combined planning of future needs for support from Health Canada. The purpose of this review would be to establish:

- which activities could be taken over by the provincial government as part of their ongoing population health programs;
- which activities could be pursued by the federal government in a research and development capacity;
- which activities could be jointly funded; and,
- which activities could be discontinued; i.e., those activities in which the provincial governments have no interest in their continuation.

Table 3 below demonstrates that many of the initiatives require the completion of additional activity to meet the objectives of the initiatives and/or respond to changing requirements. The table reflects the opinions of Health Canada managers as well as outside stakeholders with respect to continuing or not continuing with the initiatives.

Table 3: Summary of Health Canada Managers' Views on APHE

Initiative	Need for Continuation	Implications of Not Continuing the Activity
1. Drinking Water Safety	- updating of standards and guidelines must continue to ensure public confidence in Health Canada's role in quality of drinking water as it relates to health - need for ongoing monitoring and control	- without guidelines, there would be overlap, duplication and lack of harmonization across the country - will lose the ability to study and/or advise on new parameters in the future (materials and equipment largely unregulated at present)
2. Canadian Environmental Protection Act	- must continue its legislative mandate to assess the "toxicity" of substances within 5 years of being placed on the PSL (just starting PSL II) - should continue the research activities as benefits will only be known in the long term	- would have to change legislation - if research is not continued, will lose the investment of APHE funding and there will be a lack of information available for carrying out assessments of, and developing control options for, priority substances
3. Air Health Effects Program	- need to continue the activities under this initiative, in particular the development of national air quality guidelines for air pollutants, to sustain the risk assessment and risk management of air pollution and to support the national multi-billion dollar emission control initiatives being proposed	- will lose technical expertise, the ability to provide valid data for risk assessment, and the ability to provide evidence of health benefits from national air pollution control strategies - without air quality guidelines, the provinces will have no way of evaluating air monitoring data and/or there will be a lack of harmonization across the country in terms of air quality monitoring - will lose the ability to address those areas where effects are being discovered from substances at levels previously thought to be insignificant (e.g., groundlevel ozone, volatile organic compounds)

Table 3: Summary of Health Canada Managers' Views on APHE

Initiative	Need for Continuation	Implications of Not Continuing the Activity
4. Environmental Radiation and Radioactivity	Ionizing Radiation - nuclear preparedness must continue - modernization of the National Monitoring Network must continue Non-ionizing Radiation - long term research (health effects of noise and electromagnetic fields) activities should contine	Ionizing Radiation - to carry out the Minister's and the Department's mandated responsibility - if monitoring system is left as is, will continue to rely on direct readings which are neither reliable nor credible; in addition, as provinces cut back, some areas of the country may be left in a weakened position in terms of radioactive monitoring (e.g., Ontario) Non-ionizing Radiation - will lose the ability to validate preliminary results and the benefits of the investment of APHE funds
5. St. Lawrence Health Effects Program	- funding in place until March 31st, 1998 but activities should continue	- will lose the ability to act on the results of risk assessments and the studies on levels of exposure; i.e., will not be able to develop risk management strategies as well as communication strategies for the communities involved

Table 3: Summary of Health Canada Managers' Views on APHE

Initiative	Need for Continuation	Implications of Not Continuing the Activity
6. Environment-Related Disease Surveillance	Asthma Component - some studies will require follow-up - work on the respiratory effects of environmental contaminants begun under APHE should continue - National Surveillance Database will need to be maintained - asthma prevention and control strategies established by the National Control Task force should be implemented Cancer Component - regular updating and maintenance of the Case-Control and the EQDB databases established under APHE - risk management strategies and risk communications need to continue	Asthma Component - will lose ability to implement national asthma control strategies to reduce mortality and morbidity due to asthma in Canada - established asthma surveillance, prevention and control infrastructure and network will be wasted - investment in the creation of the database will be wasted Cancer Component - APHE investment in creation of database will be wasted- the data in the system will quickly become outdated as ongoing data collection and analysis is required - will not be able to develop risk management strategies or communications strategies in a timely manner
7. Market Basket Survey	- the MBS should continue as a monitoring program in order to make information more quickly available	- will lose the baseline information required against which to monitor the Canadian food supply and new information to support investigations of any trends/areas of consumption

Table 3: Summary of Health Canada Managers' Views on APHE

Initiative	Need for Continuation	Implications of Not Continuing the Activity
8. **Drinking Water Safety Program for Native Peoples**	- is continuing on under A-base (Indian Health Envelope) indefinitely and has been devolved to the regions - most activities need to continue as part of on-going departmental activity	- if assistance to communities is not continued, Health Canada will lose an effective working relationship with First Nations - if training of operators is not continued, First Nations will lose community involvement in the quality of its water system - monitoring of the water quality should continue on an ongoing basis, otherwise the dynamic problems related to water quality will not be addressed - ultimately the quality of drinking water and the health of a community would suffer
9. EAGLE	- is continuing on under A-base (Indian Health Envelope) until March 1999 and will be subsumed under Northern and Arctic Pollution - research activities started under APHE should continue - should continue periodic updating of Fish Consumption guidelines	- if research is not allowed to finish, APHE investment will be wasted as results will never emerge - if Fish Consumption guidelines not updated, will lose the ability to respond to specific trends in contaminant levels - if EAGLE as a whole is not continued, will lose the goodwill, credibility and trust built up between the Federal Government, Health Canada and First Nation partners/communities

Table 3: Summary of Health Canada Managers' Views on APHE

Initiative	Need for Continuation	Implications of Not Continuing the Activity
10. Pregnancy and Child Development	MSB Component N/A - continuing under Northern and Arctic Pollution HPB (LCDC) Component - Farm Family Newsletter should continue to be produced - the Pesticide Exposure Study needs to continue - the Canadian Perinatal Surveillance System must be allowed to come to fruition	HPB (LCDC) Component - will not be able to communicate the results of the Farm Family Healthy studies - if the Pesticide Study is not allowed to finish, will lose all the benefits of the past five years of work , both in terms of the rural participants and the international team of scientists which have provided technical expertise - loss of the CPSS will represent a lost opportunity as there is no one else to do it - reproductive health will be a primary concern in the future given the dropping birthrate
11. Northern and Arctic Pollution	MSB Component - is continuting on under A-base (Indian Health Envelope) indefinitely HPB Component - need to finish projects already started under APHE	MSB Component - will lose partnership aspect with First Nations - loss of capacity building within First Nation communities HPB Component - data just coming in and risk assessment work must be completed so that risk management strategies can be developed

Table 3: Summary of Health Canada Managers' Views on APHE

Initiative	Need for Continuation	Implications of Not Continuing the Activity
12. Healthy Environment Program	- CAP activities should continue - social marketing activities should continue as they play an important role in the environmental health area as a whole	- if CAP is not allowed to continue, communities will lose required resources to deal with environmental health issues on their own - if social marketing activities are not continued, public awareness of environmental health issues will decline
14. Active Living Environments Program	- should continue to build and maintain capacity; however, the need for funding has been reduced as a number of activities are sustainable - need to continue the establishment and maintenance of national partnerships (other levels of government, NGOs) - community development process should continue	- will lose the momentum developed as a result of the ALEP activities and the number of ALEP-like activities will decline - will lose the leadership focus and support on environment and health issues provided by Health Canada
15. International Liaison	- should continue to engage in international efforts to respond to health efffects from environmental pollutants; however, no need was identified for the continuation of grants for specific projects since these grants are usually identified by international partners such as PAHO and WHO.	- will be unable to track and respond to international activities on health and the environment that will have an effect in Canada - will be unable to represent Canada at international fora and ensure that Canada's/Health Canada;s views are taken into consideration when international agreements are negotiated

6.0 Conclusions and Lessons Learned

The conclusions and lessons learned as a result of the APHE experience that are presented below represent the key findings of the evaluation.

6.1 Conclusions

APHE Overall

- *APHE was consistent with a growing need to address environmental health issues. Public concern about the negative impacts on health of the environment has increased.*

The Action Plan on Health and the Environment was created to respond to a growing sense of urgency felt in Canada and around the world with respect to environmental problems and their impacts on health. In particular, it responded to the report by the World Commission on the Environment and Development in terms of the need to adopt a concept of sustainable development. Subsequent studies and councils have focused on ecosystem health and ensuring that the environment does not contribute to human health problems.

Since the mid-1980's, there has also been a growing awareness of the critical connection between the environment and human health where human activity is seen as the source of environmental problems, and an unhealthy environment is in turn recognized as posing a threat to the health of people. More and more, Canadians understand that when there is chemical, physical and biological stress on the ecosystem, human health is jeopardized.

Our evaluation of APHE indicated that, from 1991 to 1995, the percentage of the public which perceived pollution to be an important cause of health problems increased from approximately 50 per cent to 60 per cent. APHE endeavoured to address this concern by increasing Health Canada's ability to regulate contaminants, monitor environmental health issues, assess the risks to all Canadians as well as to specific groups, and to foster individual, community and international initiatives. A review of the Environmental Monitor's survey results indicated that APHE has not yet affected the perceived level of concerns by Canadians.

In this regard, we concluded that APHE responded to a strong perceived need of the Canadian public for action on issues related to environment and health. However, the level of public anxiety with regard to these issues continues.

- *APHE has resulted in a number of beneficial impacts on Health Canada.*

It is generally recognized that, prior to APHE, Health Canada lacked an integrated approach to linking social, environmental and economic issues that impinge on health. APHE represented a step forward in the department's ability to use a multi-disciplinary approach to address environmental health issues. In essence, APHE helped Health Canada apply a holistic definition of health and well-being.

APHE led to improved interbranch understanding and collaboration. It also permitted the department to improve its infrastructure, programs and strategies to attack environmental health issues. Finally, it increased the department's ability to work with communities and groups in improving their capacity to manage their environment and reduce environmental risks to health.

- ***There is little public knowledge of the existence of APHE or what has been accomplished through APHE.***

APHE commenced as the Health Canada portion of the Green Plan Initiative. From this perspective it fit into the Green Plan framework. Although the public opinion surveys in the past did not specifically address the level of knowledge of Canadians with respect to federal action on health and the environment, in 1996 Canadians were asked for the first time specific questions regarding Health Canada's initiatives under APHE. Only 5 per cent of respondents said that they had seen, read or heard of any publication or actions taken by Health Canada with respect to environmental health risks. However, when probed more deeply, respondents were often aware of specific ongoing activities of Health Canada related to health and environment. This was confirmed during interviews of other stakeholders conducted by the evaluation team.

We concluded that, despite efforts to promote APHE activities, public knowledge of APHE as a major Health Canada initiative was low.

- ***The objectives for APHE were very general and there were no specific criteria or indicators identified that would be suitable for evaluation. Therefore, it is very difficult to evaluate the impact that APHE had on population health.***

The objectives of APHE were to:

- **collect and provide information on; and,**
- **establish standards for, and to give advice on the management of health risk to Canadians from their environment.** [21]

These objectives, as well as the underlying objectives of the individual APHE initiatives, are generally related to outputs rather than health outcomes. Therefore, it is not possible to quantitatively measure the contribution of APHE to an improved state of health in Canada, either now or in the future. To evaluate the success of APHE, it was necessary for the evaluation team to review the accomplishments of APHE in relation to the plans and targets created for each of the individual APHE initiatives. In other words, the evaluation of APHE overall is really a summation of the success of the parts. From this perspective, we found that the vast majority of initiatives accomplished a great deal. It is difficult to assess the accomplishments versus what was planned in 1992 because of the substantial cuts in funding that many of the initiatives suffered.

We concluded that much was accomplished under APHE; however, the accomplishments cannot be compared to quantitative benchmarks or objectives that are outcome oriented. Further, even the outputs of APHE cannot be compared to any benchmarks because of the significant budget cuts and resulting changes in programming that occurred throughout.

- ***APHE funding supplemented available A-base funding for many initiatives.***

We concluded that many of the activities carried out under APHE represent either expansion or a speeding up of ongoing Health Canada activities. We determined through interviews that

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[21] Action Plan on Health and the Environment (APHE) Program Evaluation Framework, Program Audit and Review Directorate, Health and Welfare Canada, March 31, 1993, p.4.

some of APHE funding permitted Health Canada to carry out its mandate during a period of government-wide cutbacks and downsizing. This leads to two difficulties:

i) Differentiating APHE activities from ongoing activities. In many instances, it is difficult to determine the extent to which APHE contributed to additional activities over what the department would have done anyway (without budget cuts).

ii) Dependency of sunsetting funds. It is suspected by many Health Canada managers that ongoing departmental activities were funded by APHE while regular budgets were being cut. It may be difficult to replace this funding once APHE terminates.

We also concluded that some APHE funds were being used for activities that were not strictly related to environmental health.

- ***A number of APHE activities should be continued to ensure their sustainability and to preserve the APHE investment.***

An additional concern that arose is that of sustainability of many of the activities. In this report, we have identified a number of areas in which we believe a continuing Health Canada investment will be required to ensure that APHE investments are not wasted. Given the sunsetting provisions for APHE, as well as the underlying cuts in A-base funding, there is a danger that there will not be sufficient funding to maintain many of these initiatives. The following activities should be continued:

- **those required under legislation (e.g. CEPA);**
- **partially completed research studies;**
- **periodic updating and maintenance of databases;**
- **environmental health programs directed towards Native people;**
- **dissemination of all APHE outputs (i.e. reports, studies, information); and,**
- **development of risk management strategies to complement the risk assessment work.**

- ***There was a lack of a strategic plan for APHE.***

We concluded that APHE does not represent a well designed strategic initiative. Although a number of initiatives were identified along with goals, success indicators, and expected results, there was a lack of a documented plan that provided:

- **a clear quantitative set of health outcome objectives for APHE;**
- **delineation of the linkages between initiatives;**
- **a strategy for implementing change where necessary as a result of APHE findings; and,**
- **strategies for long term funding of activities initiated under APHE that would have to continue after APHE was sunsetted.**

Another shortcoming of APHE was the failure to ensure that, where appropriate, risk assessment results would lead to concrete action at the community and political level to mitigate risks identified. This does not mean that the risk measurement activity is not important; however, explicit strategies must be established to ensure that action is taken to address environmental hazards to health.

- *There was a lack of overall responsibility for APHE.*

We concluded that there was no overall responsibility for APHE at Health Canada; i.e., no one group within the department was responsible and accountable for the program. This resulted in a general inability to ensure that APHE issues were expeditiously and forcefully brought to senior management's attention.

We also concluded that there was a perception that there was insufficient senior management support of APHE in the department.

Another impact of this may have been that funding cuts were administered strategically at the Branch level but not at the corporate level.

- *The numerous funding cuts caused disruption in programming and planning.*

We concluded that the numerous funding cuts created many difficulties for managers in terms of preparing annual plans and establishing priorities. Managers were required to spend a lot of time re-adjusting their programs to constantly changing budgets. This created much uncertainty among program personnel as well as additional administrative work.

- *There was a general lack of coordination of APHE activities within Health Canada and with the Green Plan activities of other federal departments.*

We concluded that, although the APHE/Green Plan Implementation Committee provided an excellent venue for good informal communication/coordination between initiative managers and overall inter-branch communications, it was not used for substantive decision-making and hence, its mandate was limited. Further, as the Committee had no real authority over the branch representatives, many strategic issues related to community involvement never surfaced during committee meetings.

Overall, APHE was not perceived to be part of a coordinated government approach on the environment as there was little in the way of joint planning and collaboration at the beginning.

APHE Initiatives

- *APHE has resulted in numerous achievements within individual initiatives.*

In our assessments of the success of individual initiatives, we concluded that:

Regulation and Monitoring

- The Drinking Water Safety Initiative has basically met its overall intended objective; i.e., to develop scientifically defensible and economically integrated national guidelines, standards and regulatory measures:
    - the proposed Drinking Water Materials Safety Act is set to be introduced to Parliament;
    - the Guidelines for Canadian Drinking Water Quality have been revised and published and include Guidelines for Radiological Characteristics in Drinking Water; and,
    - standards have been developed for addressing water treatment by-products.

- **APHE funding supported/accelerated the conduct of activities in four main areas (i.e., regulatory, research, Section 17, and strategic options for risk management) within the framework of the Canadian Environmental Protection Act.**

- **The Air Health Effects Program initiative has resulted in the production of a significant amount of scientific data related to health impacts of air quality. Scientific and assessment information has been used to support the review and formulation of the air quality guidelines and the development of air quality management programs. This has resulted in more appropriate air quality standards for the protection of human health.**

- **Under the ionizing radiation component of the Environmental Radiation and Radioactivity initiative: the FNERP has been revised; the National Calibration Reference Centres have been updated; the National Monitoring Network has been reviewed and some modernization has taken place with the purchase of more sensitive measuring equipment; and, a groundbreaking study of the health impacts of uranium in drinking water has been completed.**

- **There is evidence to suggest that the St. Lawrence Health Effects Program initiative is addressing at least two of the four objectives; i.e., it is studying the relationship between the St. Lawrence and human health and it is assessing the risks of specific contamination.**

- **The asthma component of the Environmental-Related Diseases Surveillance initiative has been successful in contributing to:**
    - **the establishment of a solid infrastructure and network for continuing work in asthma surveillance and prevention and control;**
    - **a better understanding of the impact of asthma in Canada, asthma trends and risk factors;**
    - **the identification of high risk groups and areas of needed intervention;**
    - **the establishment of national asthma control goals and objectives; and,**
    - **identification of strategies to reduce asthma mortality and morbidity in Canada.**

- **The cancer component of the Environment Related Disease Surveillance initiative has met its overall objectives of creating a national collaborative enhanced cancer surveillance system including:**
    - **development of a national environmental quality database;**
    - **creation of a national database of detailed cancer-risk factor information on over 20,000 recently-diagnosed cancer cases and 5,000 healthy Canadians;**
    - **creation of a sophisticated data linkage and analysis system for efficient evaluation of air and water quality cancer-environment risks; and,**
    - **risk management and communication of issues including ultraviolet light and chlorination by-products in drinking water.**

- **There has been extensive methods development through the activities of the Market Basket Survey initiative. More sensitivity was needed in order to detect small amounts of the compounds under study. Heightened sensitivity of detection enabled the Food Directorate**

to expand the scope of the Market Basket Survey in terms of the numbers and nature of the compounds studied.

Groups at Risk

- **The Drinking Water Safety Program for Native People initiative is addressing its objectives; i.e., there is evidence that the initiative has contributed to: increased sampling and analysis of existing drinking water supplies for chemical and bacteriological quality; provision of advice to First Nations and DIAND on the design, maintenance and operation of community water systems; development of a training package for First Nations water treatment plant operators; and, promotion of the importance of having a potable water supply through various educational materials.**

- **The EAGLE Project has been successful in addressing its overall goal; i.e., the initiative has contributed to the blending of community and scientific knowledge in a partnership in its examination of the effects of contaminants on the health and well being of the Great Lakes Native populations. Considerable effort has been devoted to the communication of results in a manner which is deemed appropriate to all stakeholders. Extensive consultations have been held with participating communities and the coordination of study results is facilitated via regional representatives employed by the AFN. The EAGLE Project is considered to be an important model for community-based research in First Nation communities.**

- **As much work remains to be done, the LCDC component of the Pregnancy and Child Development initiative has not yet met its overall goal of providing a comprehensive program of enhanced surveillance and disease control for reproductive health as it relates to the physical and social environment. The CPSS database is not yet operational but the PEI Reproductive Child Care database is. Some success has been achieved within the individual activity areas.**

- **Overall, there is evidence that the Northern and Arctic Pollution initiative is addressing its overall goal of blending community and scientific knowledge in partnerships to examine the effects of contaminants on the health and well-being of the Northern First Nations populations. However, much of the work is in the analysis stage and the results will only be known in the long term.**

  The initiative has contributed to the organization of meetings and the facilitation of dialogue on environmental health concerns in several Northern communities.

  Overall, the studies under this initiative have provided preliminary baseline data and identified the need for studying the effect of an "intervention" through monitoring.

Facilitating Individual and Community Action

- **The Healthy Environment Program initiative activities have promoted the involvement of individual Canadians and communities in a healthy environment and have been instrumental in bringing together various groups in partnership to collaborate on issues that they share. The impacts of these activities are much longer term, therefore, it is too early to assess the extent to which the initiative has been successful in increasing awareness of environmental health issues and making it easier for Canadians to understand their own capacity to influence their health and the environment in which they live.**

- The Active Living Environments Program initiative is addressing its goal; i.e., project activities have supported and encouraged Canadians to engage in more responsible, more active and healthier outdoor physical activities that are environmentally friendly, and to enhance their collective capacity to preserve or create healthier environments for active living. In addition, ALEP is encouraging Canadians to address environmentally-based health risks like UV rays, recreational water and air pollution.

International Liaison

- The projects in the International initiative were completed as contracted and the overall goal of the initiative has been met; i.e., Canada became involved in international initiatives to reduce environmental risks to the health of Canadians (e.g., water filtration technology) and the citizens of other countries (Estonia, Latin America and the Caribbean).

Although a number of the initiatives intended to provide information to the public to better inform them of health risks in their environment, most of the information generated to date has been directed to the scientific community through journal publications, scientific conferences and presentations. A notable exception has been the provision of information and results of studies directly to the First Nation communities.

6.2 Lessons Learned

The following describes the key lessons that have been learned as a result of the APHE experience. These lessons should be considered with regard to similar types of initiatives in the future.

- *Lesson Learned: There is a need to develop a coherent strategy at the outset.*

For an action plan, such as APHE, to be effective, there should be a coherent planning structure with clear priorities and measurable objectives. This will permit a structuring of all of the components in a way that will facilitate achieving the key priorities and objectives. In the case of APHE, there is an implicit need to ensure that all projects and components have a clear link to health and environment. This would improve the ability of the Action Plan to meet tangible health outcome objectives.

- *Lesson Learned: There is a need to ensure that future action plans have appropriate organizational structures and accountabilities.*

One of the difficulties of APHE has been the unclear accountability and responsibility for the overall action plan and for achievement of results. APHE consisted of a number of initiatives that were managed by individual areas of responsibility with no one accountable for APHE as a whole. This created problems in harmonizing components, selecting priorities, and allocating budgets in the most efficient manner.

Future action plans for horizontal multi-component undertakings should identify an organizational unit that is accountable for results. This will ensure:

- a clear definition of authority and responsibility;
- clear accountability for results;
- coherent and consistent management of budgets and expenditures, planning and reporting; and,
- improved coordination.

- ***Lesson Learned: There is a need to ensure linkage between risk assessment and risk management and communications.***

For an initiative such as APHE to provide health benefits, risk assessment must be completed and the information produced must be converted to action programs (risk management) and communicated to the target populations. These activities have to be explicitly planned and budgeted; otherwise there could be a tendency to focus only on the risk assessment activities, leaving little in the way of funding to develop and communicate risk management strategies for the risks identified during the assessment stage.

- ***Lessons learned: Resource management of long term initiatives in an unstable funding environment must be improved.***

Perhaps one of the most important and difficult lessons learned from APHE is the need to develop mechanisms that permit coherent resource management of complex activities of a scientific nature in an unstable funding environment. There are a number of aspects to this problem:

- **To carry out a well designed program in a scientific environment, it is necessary to stabilize the funding requirement. Since many scientific activities are of a long term nature, once a decision has been made on an activity, there is great inefficiency in cutting or reducing the funding prematurely. Therefore, once funding levels are established, they should be maintained unless the anticipated results of the activity do not materialize or the activity is no longer required. In addition to impairing efficiency, the cancellation of commitments leaves a negative impression among partners and co-delivery agents. This implies a need to reduce the committed expenditures to a level that will very likely be sustainable. Additional funds initially available could be used in a reserve capacity, but with the understanding that these funds may not be available at a future date; and,**
- **There is a need to ensure that consideration is given to the long term sustainability of scientific activities that are initiated with the use of sunsetting funds. This means that care should be taken to ensure that A-base funds will be available to support the project after funds have sunsetted.**

- ***Lesson Learned: Five-year action plans can be too short to achieve reasonable results in health and environment activities.***

Many of the activities undertaken under APHE require a lengthy set up time and often the programs are just really getting underway as the action plan terminates. For example, in the context of a 5-year action plan, it is difficult to achieve results in working together with communities in a collaborative process. The same situation often applies for research projects. These projects require extensive time for planning, staffing, purchasing of equipment and, in some cases, the development of methodologies to be employed. It is necessary to take this into account in developing projects for an action plan to ensure that projects are not terminated prematurely, thereby leading to a wastage of the investment.

The building of capacities within community-based organizations and/or other external stakeholder organizations is also a long-term investment that may span a period that exceeds the length of a 5-year plan.

- *Lesson Learned: More comprehensive and consistent reporting of progress/results is required against plans and objectives.*

In order to properly evaluate the results and achievements of a major undertaking, such as APHE, it is necessary to have a clear, precise, comprehensive record of the original goals, objectives, achievements related to intended outcomes, and changes to these over time. If changes are not reported, it is difficult to evaluate such items as percent completed, value for money, and results achieved versus what was anticipated.

Health Canada Santé Canada

Evaluation Group

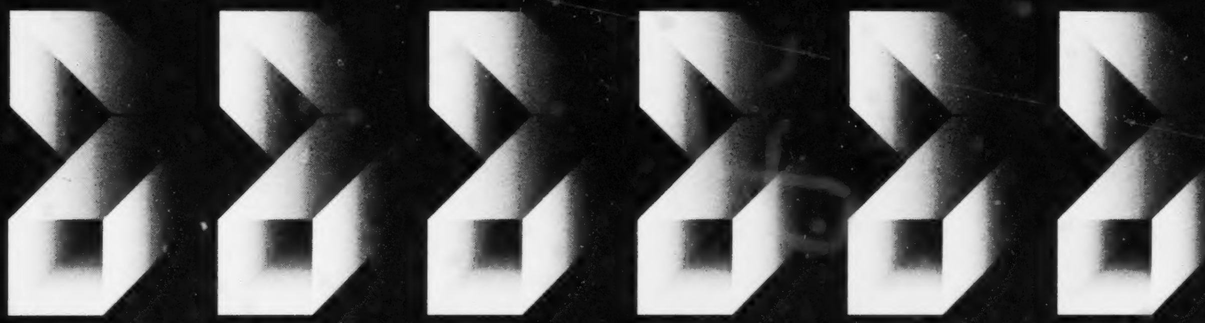
Strategic Planning and Review Directorate

Policy and Consultation Branch

Groupe de l'évaluation

Direction de la planification stratégique et de l'examen

Direction générale des politiques et de la consultation



EVALUATION OF THE ACTION PLAN ON HEALTH AND THE ENVIRONMENT (APHE) - APPENDICES

FINAL REPORT

November 1996

HC - 002-087-9622

Canada

MISSION STATEMENT

The Evaluation Group helps Health Canada serve Canadians better by providing objective information and advice about the effectiveness of departmental activities and services.

ÉNONCÉ DE MISSION

Le Groupe de l'évaluation aide Santé Canada à mieux servir les Canadiens et les Canadiennes en offrant une information et des conseils objectifs sur l'efficacité des activités et des services du Ministère.

Evaluation of the Action Plan on Health and the Environment (APHE)

Appendices

Final Report

Prepared For:

Evaluation Group
Strategic Planning and Review Directorate
Policy and Consultation Branch
Health Canada

Prepared By:

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November 14, 1996

This document has been prepared by Goss Gilroy Inc. The analysis and conclusions in this document are those of Goss Gilroy Inc. and do not necessarily reflect the views or policies of Health Canada or the Government of Canada.

Acknowledgement

We would like to express our appreciation to the Evaluation Advisory Committee, all APHE Initiative managers, the members of the APHE/Green Plan Implementation Committee, and to the many individuals who participated in the consultations. Without their cooperation, this evaluation study would have not been possible.

Appendix A:

List of Interviewees and Discussion Group Participants

List of Interviewees and Discussion Group Participants

A. Interviewees

Health Canada

1. T. Arbuckle
2. V. Armstrong
3. J. Auclair
4. J. Ball
5. S. Bly
6. C. Chynoweth
7. H. Conacher
8. J. Connor
9. S. de Villers
10. Y. Deslauriers
11. P. Dvorak
12. K. Foster
13. P. Glover
14. D. Haines
15. J. Hauser
16. R. Kwiatkowski
17. G. Kramer
18. D. Krewski
19. W. Laughing
20. R. Lawrence
21. F. Li

22. J. MacLean

23. C. McCourt

24. R. McKendry

25. Y. Mao

26. D. Meyerhoff

27. J. Moore

28. P. Mossman

29. A. Myres

30. G. Nantel

31. H. Newsome

32. R. Otsen

33. S. Paradis

34. N. Previsich

35. B. Rogers

36. M. Samora

37. T. Schoales

38. B. Thomas

39. K . Unger

40. D. Villeneuve

41. B. Wheatley

42. D. Wigle

Other Federal Departments

43. B. Braune

44. Campbell

45. R. Chatterjee

46. P. Dolan

47. H. Griffiths

48. B. Howden

49. M. Lamontagne

50. C. Letourneau

51. T. Lowrey

52. F. Lundie

53. A. McMillan

54. R. Main

55. S. Matheson

56. L. Poupart

57. B. Saunders

58. A. Sheffield

59. L. Urquhart

Other Stakeholders

60. M. Allen

61. D. Avard

62. P. Beaudry

63. L. Benedict

64. D. Bethune

65. X. Bonnefoy

66. N. Brown

67. J. Bryanson

68. J. Brydon

69. J. Butt

70. A. Cameron

71. G. Cape

72. D. Coles

73. G. Cowie

74. L. Craig

75. M. Demmer

76. E. Dewailly

77. R. Dewar

78. D. Ellison

79. J. Evanchuck

80. D. Fatum

81. B. Ferris

82. S. Gabos

83. R. Gallagher

84. K. Gibney

85. F. Godin

86. P. Gosselin

87. G. Granville

88. J. Grondin

89. S. Grundy

90. P. Hall

91. K. Harris

92. P. Hassel

93. A. Hayton

94. E. Holawaty

95. G. Jenkins

96. B. Jessamime

97. F. Johnson

98. B. Kemper

99. D. Kerr

100. H. Kuhnlein

101. J. Laurie-Lean

102. P. Lercher

103. H. Lickers

104. D. Manz

105. M Lusis

106. B. McCarthy

107. R. McClure

108. L. Marrett

109. K. Ogilvie

110. C. Olivotto

111. H. Otterstetter

112. B. Pathaks

113. M. Poulin

114. F. Pratto

115. J. Ransom

116. S. Schrader

117. T. Scrutton

118. L. Sweet

119. L. Ritter

120. A. Robinson

121. D. Robson

122. P. Rutherford

123. A. Salmon

124. A. Sanchez

125. D. Savitz

126. D. Sherwood

127. J. Shortreed

128. K. Underwood

129. B. Walker

130. J. Walker

131. M. Williams

132. L. Wilson

B. Discussion Group Participants

APHE/GREEN PLAN Implementation Committee Discussion Group

M. Hudson

F. Iverson

W. Laughing

E. Letourneau

F. Li

C. McCourt

R. McKendry

Y. Mao

J. Moore

P. Pica

N. Previsich

D. Riedel

T. Schoales

Senior Health Canada Management Discussion Group

H. Conacher

J. Harrison

D. Kirkpatrick

D. Krewski

R. Kwiatkowski

J. Losos

B. Wheatley

Technical Experts Discussion Group

K. Davies, Ecosystems Consulting Inc.

C. Henderson, Delphi Group

R. Nair, University of Ottawa

L. Smith, Ontario Ministry of Health

K. Tregunna, Canadian Public Health Association

First Nation Discussion Group

M. Cole

J. Ransom

C. List of Organizations/Affiliations Contacted

Active Living Canada

Agriculture Canada

Alberta Asthma Centre

Alberta Ministry of Environment and Energy

Alberta Ministry of Health

Assembly of First Nations

Atomic Energy Control Board

Atomic Energy Control Limited

British Columbia Hydro

British Columbia Cancer Agency

Canada Safety Council

Canadian Centre for Occupational Health and Safety

Canadian Healthy Communities Network

Canadian Institute of Child Health

Canadian Network of Toxicology Centres

Canadian Pediatric Society

Canadian Pharmaceutical Association

Canadian Water and Wastewater Association

Canadian Wildlife Service

Centre de Sante Publique du Quebec

Center for Disease Control and Prevention

Dalhousie University

Department of Indian Affairs and Northern Development

Department of Health and Social Services, Government of the Northwest Territories

Ecohawk

Environment Canada

The Evergreen Foundation

Federal-Provincial Working Group on Air Quality Guidelines

Fish Contaminants Monitoring Program

Health and Environment Aboriginal Life

Health Canada

Industry Canada

Industry Co-ordinating Group

International Development Research Centre

Keewatin Regional Health Board

Labrador Inuit Association

McGill University

McMaster University

Manitoba Fitness Directorate

Manitoba Keewatinowi Okimakanak

Mining Association of Canada

Mohawk Council of Akwesasne

National Institute for Occupational Health and Safety

New Brunswick Department of Health and Community Services

New Brunswick Department of Municipalities, Culture and Housing

Nova Scotia Cancer Registry

Nova Scotia Sport and Recreation Commission

Nox/VOX Science Program

OCTRF

Ontario Cancer Registry

Ontario Ministry of Environment and Energy

Organization for Economic Development and Cooperation

Ottawa Instrumentation

Pan American Health Organization

Participaction

Pollution Probe

Prince Albert Grand Council

Prince Edward Island Department of Health

Prince Edward Island Reproductive Care Program Inc.

Pwi-bi-goo-zing Ne-ya-zhing

Rails to Greenways Coalition

Saskatchewan Cancer Foundation

Shell Canada

STOP

Transport Canada

University of Calgary

University of Innsbruck

University of North Carolina

University of Waterloo

University of Western Ontario

Wabaseemoong Education Authority

Walpole Island Heritage Centre

The Weather Network

World Health Organization

Yukon Territory, Workers Compensation and Safety

Appendix B:

Profiles of APHE Initiatives

Initiative 1: Drinking Water Safety Initiative (DWSI)

Objectives/description of initiative

The overall goal of this initiative is to safeguard the drinking water of Canadians and reduce exposure to environmental contaminants through drinking water by the development of scientifically defensible and economically integrated national guidelines, standards and regulatory measures. Health Canada is proposing legislation that would set mandatory national health standards for drinking water materials and establish a national certification system to ensure that these standards are met.

Activities

Forty projects were initiated in eleven major target areas: three target areas address risk assessment and eight target areas address risk management. The goal statements for the major activity areas are as follows:

- To identify and report the significant health hazards of 12 chemical and microbiological waterborne contaminants by 1997.
- To estimate human exposure to disinfection by-products, and 15 waterborne contaminants by 1997.
- To integrate uncertainty analysis methods into the drinking water guideline development process by 1997.
- To develop and revise 15 guidelines and supporting documents and provide timely responses to emergencies by 1997.
- To review the health aspects of claims made on 21 treatment devices, 4 components, and 6 treatment chemicals by 1997.
- To facilitate passage of the Drinking Water Materials Safety Act and promulgate Regulations by 1997.
- To develop compliance systems and 10 national standards for water treatment devices, treatment chemicals and system components in cooperation with National and International standards organizations by 1997.
- To assess and report on the effectiveness of 10 water treatment methods in meeting the Canadian guidelines by 1997.

- To develop and disseminate 15 informational materials, respond to public enquiries, and enhance awareness of drinking water issues by 1997.
- To publish the 6th edition and initiate work on the 7th edition of the Guidelines for Canadian Drinking Water Quality and supporting documents by 1997.
- To provide adequate and timely response to EARP submissions, scoping documents, panel reports etc. as instructed for the Department by 1997.

The following activities have been completed:

- Stakeholder and interdepartmental consultations were held in regards to the safety of drinking water materials.
- The 6th edition of the Guidelines for Canadian Drinking Water Quality was updated and revised. These guidelines were developed by the Federal/Provincial Sub-Committee on Drinking Water. All provinces and territories participate and utilize the guidelines that are produced.
- Meetings with the major water industry representatives were held to discuss issues of mutual interest.
- A memorandum to Cabinet was prepared and submitted for the proposed Drinking Water Materials Safety Act. This Act would require certification against health based standards for drinking water materials.
- Work on draft legislation has started as well as that on supporting documents for the Drinking Water Materials Safety Act.

Activities which need to be completed are as follows:

- Complete publication of 4th group of supporting documents.
- Work continues to introduce a Bill on drinking water materials in Parliament in the fall of 1996.
- Develop a framework for determining the health and economic impact of water quality guideline
- Identify appropriate national standards for water treatment devices, treatment chemical and system components.
- Complete and publish the results of the National Survey of acids in raw and treated drinking water collected from 50 Canadian municipalities.

- Develop and distribute the "It's Your Health" fact sheet to inform the public of risks resulting from contaminants in drinking water.
- Publish the results of the risk assessment studies in scientific journals and present these results at national and international drinking water-related scientific meetings.
- Participate in national and international water association committees.
- Prepare an incidence report for waterborne illness and disease in Canada.
- Report the final results of the national surveys of organic, inorganic and protozoa in municipal drinking water supplies and shallow wells to the provinces and municipal plant operators.

Financial Summary

	91-92	92-93	93-94	94-95	95-96	96-97
FTE	4	9	10	10	11	6
Salary	40K	693K	737K	670K	737K	402K
Operating	100K	525K	734K	1409K	1332K	1243K
Capital	150K	200K	650K	350K	120K	100K
Total	190K	1418K	2121K	2429K	2189K	1745K

Clients/Stakeholders

All provinces and territories are involved in the development of the Guidelines for Canadian Drinking Water Quality and utilize the guidelines that are produced. The publication "Guidelines for Canadian Drinking Water Quality" is targeted to multiple public sector clients at the federal, provincial and municipal levels. The guidelines have the force of law in federally-regulated jurisdictions only.

The Drinking Water Materials Safety Act will be national in scope, setting mandatory national health standards for drinking water materials and a national certification system will be established to ensure compliance of these new standards.

Accomplishments/Outcomes

The major accomplishments of this initiative are as follows:

- Completion of several drafts to the Drinking Water Materials Safety Act.

- Develop and distribute the "It's Your Health" fact sheet to inform the public of risks resulting from contaminants in drinking water.
- Publish the results of the risk assessment studies in scientific journals and present these results at national and international drinking water-related scientific meetings.
- Participate in national and international water association committees.
- Prepare an incidence report for waterborne illness and disease in Canada.
- Report the final results of the national surveys of organic, inorganic and protozoa in municipal drinking water supplies and shallow wells to the provinces and municipal plant operators.

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The Drinking Water Materials Safety Act will be national in scope, setting mandatory national health standards for drinking water materials and a national certification system will be established to ensure compliance of these new standards.

Accomplishments/Outcomes

The major accomplishments of this initiative are as follows:

- Completion of several drafts to the Drinking Water Materials Safety Act.

- Revision and publication of the Sixth edition of the "Guidelines for Canadian Drinking Water Quality".
- Provision of expert advisory services and response to emergency situations.
- Production and publication of research results in peer-reviewed scientific journals and in the form of abstracts and proceedings of drinking water-related conferences.
- Broad communications to the public of the risk (or lack of risk) to health resulting from the presence of contaminants in drinking water is accomplished through fact sheets such as "It's your Health"; presentations at the 7th National Drinking Water Conference in Charlottetown in August 1996, and other media.
- Participation in regional, national and international water association committees and societies dealing with drinking water quality, public education and information. E.g., Federal-Provincial Subcommittee on Drinking Water, the Canadian Water and Wastewater Association, the National Sanitation Foundation International (USA), the International Organization for Standardization (ISO), and the World Health Organization (WHO).
- Provision of advice to the public, other government agencies, industry and private organizations on current and emerging issues relating to drinking water quality. Below is a summary of advice items, indicating that clients have received information regarding this initiative.

Summary of Advice Items (1995/96):

telephone enquiries	597
letters	295
briefings	47
memos	2
Media contacts	48
Parliamentary contacts	1
Documents reviewed	75
Presentations	7

- Lectures, seminars, workshops and courses on drinking water quality issues have been delivered to professional organizations, universities, technical colleges, neighbourhood associations and environmental groups. The topics included the development and derivation of guidelines for public health protection, legislation and regulation for drinking water quality and water treatment to control contaminants in the distribution system.

The following outputs were reported in the Project Area Review 1996-1997:

	1994-95	1995-96
Publications (journals, books abstracts, proceedings, etc.)	31	23
Presentations (scientific meetings, seminars, courses, lectures)	19	14
EHD Reports	2	1
Product or Device evaluations	11	8

Initiative 2: Canadian Environmental Protection Act (CEPA)

Objectives/description of initiative

Goal Statement

To identify, assess and manage the health risks of priority substances under the Canadian Environmental Protection Act (CEPA).

Rationale

Under CEPA, the Ministers of the Environment and of Health must assess whether substances on the Priority Substances List (PSL) are "toxic" (as defined under CEPA) within 5 years of their being placed on the list.

Following on the successful completion of assessments on 44 substances on the first PSL (PSL I) within the legislated deadline of 11 February 1994, the second CEPA Priority Substances List (PSL II) comprising discrete substances as well as releases and emissions, was published in the Canada Gazette Part I on 16 December 1995. Health Canada also shares with Environment Canada responsibility for developing measures to control the release of "toxic" substances to the environment. A consultative approach (Strategic Options Process or SOP) for developing options for managing releases of "toxic" substances has been put into place and will continue in the current fiscal year. New information necessary for carrying out assessments of, and developing control options for, priority substances will be generated by conducting a number of projects in accordance with Section 15 of CEPA.

Activities

There are 4 areas of activity within this initiative:

- **Regulatory**

Activities include:

- The assessments of the 44 substances on the Priorities Substance List I (PSL I)
- The preparation of a booklet on tolerable daily intakes (TDIs) and tolerable daily concentrations (TDCs) with a view to announcing its availability in the Canada Gazette in accordance with Part I of CEPA has been initiated.

- A booklet on tolerable daily intakes (TDIs) and tolerable daily concentrations (TDCs).
- Work has begun in developing and publishing Priority Substance List II (PSL II). A list of 25 substances has been prepared.
- Technical and administrative support for the Ministers' Expert Advisory Panel on PSL II was provided.
- The preparation of health-related sections of assessments for compounds which are high priority candidates for, or included on, PSL II are currently underway.

Future activity includes the assessment of new data on PSL I substances as required, and the preparation of health-related sections of assessments for compounds which are high priority candidates for, or included on, PSL II.

- **Section 17**

Under Section 17 of CEPA, Environment Canada forwards all information it has collected concerning potential adverse health affects to Health Canada for assessment.

- **Risk Management**

HC shares responsibility with EC for assessing the need to control substances deemed to be "toxic" as defined by Paragraph 11 of CEPA, and to develop appropriate control strategies. APHE funding enabled EHD to initiate the development of principles for managing the health risks of "toxic" substances and participate in the Strategic Options Process (Risk Management) developed by EC.

Future Activity includes participating with EC in the development of control options for PSL I substances deemed to be "toxic" and in multi-stakeholder consultations to eliminate or reduce "toxic" substances in the environment.

- **Research**

A number of laboratory studies are being conducted on priority substances to fill data gaps in the toxicology data base.

Future Activity includes the investigation of the subchronic toxicity of selected PSL II substances, The investigation of the reproductive/developmental toxicity of selected PSL II substances, the evaluation of new and more sensitive biomarkers of reproductive toxicity, and the completion of additional studies to acquire data on the multimedia exposure of Canadians to priority substances have also been planned.

Financial Summary

Green Plan Funding - CEPA Initiative

	Salary*	Capital*	O&M*	Total	O&M Allocations (%)		
					Research	Evaluation	Communication
1991-92	$ 64,000	$ 50,000	$300,000	$414,000	53	47	0
1992-93	$564,000	$ 80,000	$ 718,000	$1,362,000	34	65	1
1993-94	$564,000	$ 80,000	$886,000	$1,530,000	38	40	22
1994-95	$564,000	$ 90,000	$1,037,000	$1,691,000	27	64	9
1995-96	$627,000	$100,000	$968,000	$1,695,000	44	53	3
1996-97	$627,000	$100,000	$981,000	$1,708,000	51	49	0

* Reprofiled Funds

NB. All PYs allocated to evaluation projects

Clients/Stakeholders

The stakeholders of The Canadian Environmental Protection Act are other Health Canada branches, other federal departments, industry, the scientific community, international regulatory agencies, and ultimately the general public.

Accomplishments/Outcomes

The major accomplishments of this initiative are as follows:

- Regulatory

- The assessment process was accelerated by APHE funding, thus enabling the completion of 44 PSL I assessments by the legislative deadline of February 11, 1994.

- Of the 44 substances assessed, 18 were determined to be "toxic" with respect to health (APHE aspect) as defined by paragraph 11 (c) of the CEPA - *"constituting or that may constitute a danger in Canada to human life or health"*, 13 were assessed as nontoxic, for 8 there was insufficient data for a conclusion, and for the remaining 5, no assessment was conducted (already covered under other regulations, insufficient information to estimate the exposure of humans, n/a for human populations) .

- More than 600 candidate substances for PSL II have been scored on the basis of technical criteria completed and a "mechanical list" generated for consideration by the Ministers' PSL II Expert Advisory Panel.

- Provided the Secretariat for meetings of Federal Caucus, Health Canada Working Group and Ministers' Advisory Panel which finalized PSL II.
- Drafts of health-related supporting documentation for seven high priority PSL II substances have been completed and are undergoing internal review and revision.
- Background notes prepared for top 30 Substances Assessments for 36 substances scored for PSL II were completed for incorporation into CESARS database of the Ontario Ministry of Environment and Energy.
- Several of the assessment reports will form the basis of environmental health criteria documents published by the International Program on Chemical Safety (IPCS).
- The guidance and approach documents will assist efforts to harmonize risk assessment procedures internationally; e.g., through IPCS and the OECD.
- Following upon the advice of The Ministers' Expert Advisory Panel, the second PSL comprising discrete substances as well as releases and emissions was published in the *Canada Gazette Part I* on December 16, 1995.
- Preparation of background documentation and information gathering is underway for other compounds on PSL II
- A review of new pharmacokinetic data on dichloromethane was initiated to assess any potential impact on the conclusions reached in the PSL I assessment report on this substance.

- **Section 17 submissions**

- Health Canada's evaluation work on these submissions helped eliminate the backlog of S.17 submissions (over 500 S.17 submissions). 445 submissions received under S.17 were evaluated and advice was provided to Environment Canada on the hazard associated with most of them.
- A draft document that contains guidance on what information should be provided has been completed and distributed.
- Database for S.17 files completed

- **Risk Management**

- Guiding principles were finalized for the risk management of toxic substances.

- Background documents (prepared by EC) for substances "toxic" to health.
- started consultation phase of Strategic Options Process (SOP) were revised.
- Communications initiatives (CEPA Toxics Newsletter, 5 draft HPB Issues Papers).
- 3 draft reports (managing the health risks of three substances deemed "toxic"; i.e., PERC, benzidine/dichorobenzidine and ceramic fibres) are awaiting ministerial review.

- **Research**

In total, 17 studies were initiated between 1991 and 1996, with 4 studies planned for 1997:

1991-92: 3 studies totalling $160K

1992-93: 4 studies totalling $245K

1993-94: 4 studies totalling $335K

1994-95: 3 studies totalling $230K

1995-96: 3 studies totalling $330K

1996-97: 4 studies planned totalling $303K

Research results identified to date include:

- The development of a technical proposal for the use of biomarkers as indicators by which the effectiveness of proposed control measures for various toxic substances under CEPA may be assessed.
- The assessment of multi-tissue exposure to priority substances by using a multiplex of biomarkers assembled as a single molecular toxicity assay.
- Screening priority environmental contaminants for potential effects on the human endocrine and reproductive functions and characterize the endocrine and reproductive toxicity of selected priority substances using *in vivo* methods.
- The determination of the subchronic oral toxicity of three PSL II substances in the rat and validated two non-invasive biomarkers.

The results of research are published in peer reviewed scientific journals. Fifteen (15) publications and meeting presentations have emanated from CEPA-APHE research (1991-1996) activities.

Other outputs include:

A public information brochure *"Protecting Human Health Under the Canadian Environmental Protection Act"*, published by Health Canada, explains the nature of the department's role under CEPA and how it effects the public. *"Human Health Risk Assessment for Priority Substances"* (the approach to determining "toxic") is available through EHD at Health Canada upon request.

The results of the risk assessments were published as a series of "Priority Substance List Assessment Reports". Supporting technical documentation on the health-related sections of these assessments are available upon request.

A report on health-related research needs and data gaps for PSL I substances was prepared and made available to the research community.

The rulings proposal, *Guiding Principles for the Risk Management of Toxic Substances (Final)*, June 23, 1995, provides a guide for risk managers with EHD or eventually the entire HPB in defining appropriate strategies for the risk management of individual toxic substances.

Six manuscripts were prepared and three presentations were made on PSL I assessments as well as on the screening system employed for the selection of compounds for PSL II.

The outcome of PSL I assessments has been communicated to the scientific community through a series of papers published in the Journal of Environmental Science and Health (Special Issue, Vol. C12, No. 2, 1994) and to the general public through a series of HPB "Issues Papers". The issues papers are: inorganic fluorides, man-made vitreous fibres, methylene chloride, health risks and chemical carcinogens. In addition, an Issues paper, *"Reducing the Risks of Toxic Substances under CEPA"* has been written in collaboration with EC to explain the process of managing risks of substances deemed "toxic" under Section 11 of CEPA.

Initiative 3: Air Health Effects Program (AHEP)

Objectives/description of initiative

The main goal of the Air Health Effects Program is to research and assess health risks posed by acid rain, airborne particles, ground level ozone, and other air pollutants by identifying the hazards associated with airborne contaminants, estimating the risks to human health, participating in the management of risks, and communicating the risks.

Activities

38 projects were initiated under this initiative. The main target areas include:

- The identification of health hazards of ground-level ozone, acid aerosols and particles.
- The assessment of the inhalation toxicity of oxygenated fuel mixtures.
- The estimation of the exposure to oxygenated and aromatic organic airborne contaminants.
- The development of predictive modeling and measurement techniques for ground-level ozone and VOCs (volatile organic compounds).
- The characterization of the population exposed to acid aerosols, particles, ground-level ozone, moulds and fungi.
- The evaluation of the health risks associated with 6 fuels and fuel-related compounds.
- The implementation of a plan of action for dealing with Indoor Air Quality.
- The development of national air quality objectives for 7 air pollutants.
- The provision of an adequate and timely response to CEAA submissions, scoping documents, panel reports, etc..
- The implementation of a risk communication strategy for 4 airborne contaminants.

The research activities involved in this initiative include laboratory investigations, animal studies, human clinical investigations, exposure assessments, epidemiologic studies, and national surveys.

The status of the 38 projects that were initiated are as follows:

Completed Projects

1. **Aging and Ozone Study (281232)**

   Description: Characterize in an animal model the impact of aging on the susceptibility of the lungs to an ozone-mediated injury.

2. **Neurotoxicity of VOC's (281239)**

   Description: Assess the utility of neurotoxicological methods using both in vitro and in vivo preparations to detect adverse neural effects due to exposure to airborne pollutants.

3. **Transgenic Mouse - Trichloroethylene (281240)**

   Description: Test a mutagenic volatile organic chlorine (VOC) compound to demonstrate the utility of the transgenic mouse model for detecting gene mutations in vivo for the study of mutations induced in the lung, and other tissues, using inhalation exposure.

4. **Clusters of Health Events - Air Pollution (281247)**

   Description: Develop and pilot test criteria and a review process for the purpose of prioritizing requests for assistance in the investigation of clusters of health events.

5. **Canadian Residence - VOC Study (281301)**

   Description: Evaluate results from the pilot study of selected VOCs in Canadian residences.

6. **IAQ - Reports (282302)**

   Description: Review and evaluate results of IAQ related studies and prepare reports on the measurement, occurrence and sources of airborne organics.

7. **MMT Risk Assessment (282310)**

Description: To re-assess the health implications of the use of MMT as a gasoline additive in Canada, and to recommend whether or not a Canadian air quality objective for manganese in necessary.

8. **Risk Communication (283204)**

Description: To develop a public risk communication framework for the Air Quality Program and convene, in collaboration with Environment Canada, an environment and health - risk communication - media day.

9. **Risk Communication - AQHER (283205)**

Description: Conduct a thorough and systematic evaluation of the effectiveness of risk communication initiatives undertaken by the Air Quality Section, specifically, of the Canadian Smog Advisory Program and of Issues sheets on air pollution.

10. **Particles - In Vitro Toxicity(281225)**

Description: Complete analysis of the relative toxicity of airborne particles collected at several locations using in vitro methodologies.

11. **Respirable Particles - In Vivo Studies (281235)**

Description: Study in animal models the pulmonary effects of inhalation exposure to respirable particles obtained from ambient urban air.

12. **Canadian Human Activity Patterns Study (CHAPS) (281402)**

Description: Subanalyses of the Canadian time-activity to establish the relative importance of time activity information in the overall framework of exposure assessment.

13. **24 Cities Follow-up (281216)**

Description: Initiate and implement a study in Canada and the US to determine if the observed decrements in lung health of children observed in the original 24 Cities study are permanent and persist into adolescence.

14. **Saint John Emergency Department Study (281245)**

Description: Analyse the relationship between air pollution and health outcome in Saint John.

15. (283401)

Description: Provide information to government, other agencies and the general public on ambient and indoor air quality issues relating to human health.

Projects on-schedule

16. Fraser Valley Study (281228)

Description: To collect spirometry data on healthy adults working outdoors in the Fraser Valley and to relate the results to ground-level ozone exposure.

17. Assessment of Carbon Monoxide (281311)

Description: Report on the human health effects of carbon monoxide, and recommend National Ambient Air Quality Objectives.

18. PM10 Objectives (282313)

Description: Complete health assessment for PM10 and propose an health based National Ambient Air Quality Objective for PM10.

19. Assessment of Gaseous Fluorides (282311)

Description: Report on the human health effects of gaseous fluorides, and on the need for a National Ambient Air Quality Objective and emission control actions.

20. TRS Compounds (282314)

Description: Report on the human health effects of total reduced sulphur compounds, and recommend National Ambient Air Quality Objectives.

21. IAQ - Microbiologicals Ad Hoc Working Group (282405)

Description: Complete the work of the ad hoc federal-provincial working group under the federal-provincial CEOH to develop interim guidelines for the interpretation of data on the mycoligical quality of indoor air.

22. Acid Particles - Barometric Toxicology (281217)

Description: Utilize previously developed methodologies to characterize the effects of particulates on the airways in guinea pigs in an attempt to elucidate the mechanisms that make specific individual animals more sensitive than others.

23. **Biomarkers (281218)**

Description: Study to measure the time course of ozone-catalysed salicylate hydroxylation.

24. **(282321)**

Description: Based on Particulate Matter apportionment issues, determine the feasibility of extrapolating existing ambient air assessments to the indoor environment for the development of guidelines.

Projects behind-schedule

25. **IAQ Guidelines Approach (282315)**

Description: To reassess the approach taken to set indoor air quality guidelines in residences, incorporating current issues and re-defining what is termed as "good" indoor air quality.

Deleted Projects

26. **Global Climate Change (281234)**

Description: An expert advisory panel will be set up to review the proposed framework of the global change and to organize a multidisciplinary scientific consensus building workshop. The purpose is to identify and prioritize research needs on health related global warming issues.

27. **Human Histopathology (281241)**

Description: To examine human lungs obtained at autopsy in young adults for effects of chronic exposure to ozone and ambient particulate matter.

28. **Monitoring of Microbiologicals (281242)**

Description: Develop a biomonitoring method strategy for assessing human exposure to airborne microbes.

29. **EARP (282306)**

Description: Upon request, provide adequate and timely response to EARP submissions, scoping documents, panel reports, etc. as instructed for the department.

30. **UFFI Home Study (282307)**

Description: To re-evaluate existing data for levels of formaldehyde in both UFFI and conventional homes across Canada.

Newly established projects

31. **(284201)**

Description: Develop scientific contacts, exchange scientific information and initiate collaborative studies to examine the effects of air pollutants on health.

32. **Cardiovascular Effects of Air Pollution (281249)**

Description: Determine the feasibility of identifying electrocardiographic and haematological responses to air pollution exposures in a susceptible population.

Delayed Projects

33. **Nox/VOC Management Plan (282304)**

Description: Complete assessment of ozone and complete development of a position on a 6-8 hour objective for ozone exposure.

34. **Assessment of Nitrogen Oxides (282312)**

Description: Report on the human health effects of nitrogen oxides and recommend National Ambient Air Quality Objectives.

35. **Working Group on Air Quality Objectives and Guidelines (282303)**

Description: Contribute to the development and revision of National Ambient Air Quality Objectives and Guidelines by acting as Secretariat, in collaboration with Environment Canada.

36. **Administrative Data Studies (281208)**

Description: To assess the health impacts of air pollution on Canadians using national administrative databases (e.g., mortality, hospital admissions).

37. **(282322)**

Description: Assess human health impact of sulphur dioxide.

38. (283305)

Description: Preparation of issues papers and response to communications on ambient air related subjects and guideline development.

Financial Summary

	91-92	92-93	93-94	94-95	95-96	96-97
FTE	3	4	8	8	10	10
Salary	71K	404K	517K	536K	666K	668K
Operating	300K	660K	299K	1038K	1305K	858K
Capital	200K	0	300K	200K	200K	200K

Clients and Stakeholders

Internal Health Canada clients, other government departments (Federal and Provincial), the scientific community, and the Canadian population as a whole with regard to health protection are the stakeholders of the Air Health Effects Program.

Accomplishments/Outcomes

The project achievements to date are as follows:

1. **Aging and Ozone Study (281232)**

   The purpose of this goal was to characterize the toxicodynamics of ozone in the lungs of rats at the three stages of the lifespan in order to critically evaluate recent data on the chronic toxicity of ozone and for the assessment of an experimental model for a potentially sensitive subgroup of the population. Studies using lung lavage, morphometry and cytokinetics have confirmed a higher sensitivity of senescent rats.

2. **Neurotoxicity of VOC's (281239)**

   Exposures to tetrachoroethylene at near real life exposure concentrations (80 ppm) resulted in significant changes in the rhythmical slow wave activity of the rat hippocampal slices. A paper has been submitted for publications from this pilot study.

38. **(283305)**

Description: Preparation of issues papers and response to communications on ambient air related subjects and guideline development.

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   Exposures to tetrachoroethylene at near real life exposure concentrations (80 ppm) resulted in significant changes in the rhythmical slow wave activity of the rat hippocampal slices. A paper has been submitted for publications from this pilot study.

3. **Transgenic Mouse - Trichloroethylene (281240)**

No mutation induction was found in mouse tissues, suggesting that TCE does not induce gene mutations in vivo. The results were presented at the Environmental Mutagen Society meeting in March 1995.

4. **Clusters of Health Events - Air Pollution (281247)**

A literature review, contact with key agencies, draft cluster investigation process and a meeting with other stakeholders in the Department were completed.

5. **Canadian Residence - VOC Study (281301)**

Assessment of data on the occurrence of 92 VOCs in Canadian homes has been completed and some of the results were presented at an ASTM symposium.

6. **IAQ - Reports (282302)**

Progress with data evaluation was relatively slow due to lack of resources. Five manuscripts have been prepared and submitted to scientific journals and meetings.

7. **MMT Risk Assessment (282310)**

The report on MMT was finalized and a summary document was produced in french and English. An abstract for a presentation at a risk assessment conference in Copenhagen was prepared and accepted.

8. **Risk Communication (283204)**

An air quality risk communication workshop was held and a multi-stakeholder advisory committee met to discuss and advise on an air quality risk communication framework. A draft framework was produced and all work plan phases were completed.

9. **Risk Communication - AQHER (283205)**

Results (recently published) indicate that smog advisories have been partially successful in generating awareness but only marginally successful in promoting action.

10. **Particles - In Vitro Toxicity(281225)**

Analysis of the in vitro potency of airborne particles, collected at six stations in Southern Ontario and Michigan in summer '92 was completed and the data were analysed for ranking of the potency of the particulate preparations.

11. **Respirable Particles - In Vivo Studies (281235)**

Several acute and short-term repeated exposures to EHC-93 particles alone, ozone alone, and EHC-93 and ozone together were conducted. Several biochemical and in vitro endpoints were used and standard lavage cytology was conducted on several of these animals. Samples of lungs and trachea in addition to several other tissues were collected and fixed for histological processing.

12. **Canadian Human Activity Patterns Study (CHAPS) (281402)**

Preliminary analyses show that Canadian activity patterns are consistent with those observed in the U.S. despite differences in climate. A paper on methods and preliminary results has been submitted for publication.

13. **24 Cities Follow-up (281216)**

The contract report was received and identified important limitations in the methodological methods used for field data collection and in the analysis of the main effects.

14. **Saint John Emergency Department Study (281245)**

Preliminary results reveal an association between ozone and asthma emergency department visits and that there is a significant quality of life and economic burden associated with air pollution related emergency department visits. Several papers have been presented at conferences and/or submitted for publication.

15. **(283401)**

Advice and information were provided as required and manuscripts, research proposals, abstracts, and other documents were reviewed. Posters and platform presentations were made at a number of national and international scientific conferences. Participated in the Air Quality - Action Plan Working Group. A draft document was prepared on the use of molecular techniques/PCR in microbial indoor air quality investigations. Advice items include: 40 telephone inquiries, 6 written inquiries, 7 briefings and 4 documents reviewed.

16. Fraser Valley Study (281228)

Significant reductions in lung function were observed in healthy active adults working outdoors in relation to ground level ozone exposure. A number of manuscripts have been published and/or accepted for publication.

17. Assessment of Carbon Monoxide (281311)

The existing carbon monoxide criteria document was updated and reassessed. Peer review comments were incorporated into the draft document and a proposal developed for presentation to the Bureau Rulings Committee.

18. PM10 Objectives (282313)

A draft assessment of PM10 was developed. Comments received from the CEPA/FPAC Working Group on Air Quality were incorporated into a second draft. A proposal for an air quality guideline was developed but finalization of a protocol for the development of such guidelines is needed.

Completed final risk assessments for ground-level ozone. Provided report and recommendations for the Nox/VOC management program for incormation of health issues in future action plan on ground-level ozone, including a new national air quality objective.

19. Assessment of Gaseous Fluorides (282311)

A proposal for the Bureau Rulings Committee was developed and needs final considerations from the CEPA/FPAC Working Group on Air Quality. An assessment document for hydrogen fluoride was developed as well.

20. TRS Compounds (282314)

A contract report was developed assessing both the toxicity and exposure to this group of compounds.

21. IAQ - Microbiologicals Ad Hoc Working Group (282405)

Three meetings were held in the spring/summer '94. The draft of the guideline document was prepared and distributed for peer review.

22. Acid Particles - Barometric Toxicology (281217)

One paper was published from the work on the effects of acid aerosols on the mucus/surfactant layer in the lungs. A collaborative study between the University of Calgary and the Inhalation Toxicology lab was carried out. The analysis is continuing.

23. **Biomarkers (281218)**

Salicylate hydroxylation appears to be a sensitive marker of exposure to ozone and other oxidants. Results were recently presented at an international conference.

25. **IAQ Guidelines Approach (282315)**

The report on CO2 levels in homes has been completed an shows a routine exceedance of the indoor air guidelines in a majority of homes overnight. There are suggestions that infants and cardiopulmonary compromised individuals are at greater risk.

35. **Working Group on Air Quality Objectives and Guidelines (282303)**

Assessment documents for carbon monoxide and hydrogen fluoride were developed and updated and recommendations for ambient air quality guidelines made. Secretariat duties were performed. Assessment for particles was begun by summarizing the existing draft EPA document and providing a preliminary recommendation of a guideline based on recent epidemiological data to the CEPA/FPAC working group. Protocol for the development of Air Quality Objectives is undergoing final revisions.

36. **Administrative Data Studies (281208)**

Results to date have revealed associations of ozone particles and other pollutants with outcomes including mortality and hospital admissions for various respiratory and cardiac conditions. Several manuscripts have been published and/or submitted.

The major accomplishments of this initiative are as follows:

- Development of National Air Quality Objectives.
- Conducted toxicological studies in new areas (e.g., particulate matter, ground level ozone, VOCs, etc.)
- Conducted evaluations of health risks of 6 fuels and fuel-related compounds.
- Conducted population studies related to air pollution.
- Produced publications and held conferences and seminars.

- Tracked admissions in 184 hospitals.
- A total of 121 reports have been published since the initiative began in 1992.

Publications (Total per year):

1992 - 15

1993 - 17

1994 - 34

1995 - 40

1996 - 15

Initiative 4: Environmental Radioactivity and Radiation (ERR)

Objectives/description of initiative

This initiative was designed to address health concerns that Canadians have related to nuclear reactors and electric power lines, towards environmental factors such as noise and solar UV, and concerns they have about working with radioactive materials. This Initiative will allow Health Canada to determine the effects of these developments and factors on the health and well-being of Canadians, improve response to nuclear emergencies, respond to public concern and, manage health risks.

The overall goals are to assess and manage cancer risks and reduce psychological stress from nuclear facilities in Canada and to mitigate the consequences of a nuclear accident on the Canadian public, prevent radiation injury, assess and manage cancer risks; and reduce psychological stress for occupationally exposed workers.

Activities

There are 2 components within this initiative:

1. Environmental Radiation - ionizing radiation

Within Environmental Radiation - ionizing radiation, there are 4 activity areas:

1.1 National Calibration Centres

The basic goal is to upgrade the National Calibration Reference Centres to accurately measure internal contamination in women, to ensure that Canadian facilities can accurately measure exposures below the new, lower dose limits soon to be imposed by the AECB , and to be able to offer new bioassay intercomparison programs needed by occupationally exposed workers.

APHE dollars were used to purchase and calibrate new equipment such as the new "phantom" mannequin which approximates female proportions, a new ultrasound unit for chest wall thickness measurements, and a new lung counting system for uranium deposition.

These centres are in the process of developing a plan for revenue generation. Resources will be utilized to develop a quality assurance program that can be approved by the Atomic Energy Control Board (AECB) and recommended to licensees.

1.2 *Chronic Uranium Uptake*

The goal is to assess the uptake of uranium under chronic ingestion conditions and evaluate the usefulness of biological indicators of kidney damage. APHE enhanced an already ongoing study of 2 communities begun in 1992 which is a collaboration between the Radiation Protection Bureau and the Atomic Energy Control Board (AECB). A study was conducted on the population of a community whose drinking water source, private wells, contain high levels of uranium due to geological circumstances.

Data collection is finished and the first of 3 papers drafted called *"Uranium in Drinking Water - A Study of Nephrotoxicity in Humans"* is being revised. A second paper, *"Uranium Gastrointestinal Absorption Studies - Design Issues"* has been drafted, and a third paper on the f_1 uptake factor determined in the study is still to be determined.

1.3 *National Radioactivity Monitoring Networks*

The specific goal is to implement recommendations of the contract to revitalize and restructure the National Radioactivity Monitoring Network and improve the laboratory treatment of samples. They have a 1-year contract to track and issue a questionnaire to everyone who does monitoring to check for duplication. Duplication was found in Ontario. Other countries were also looked at.

Analytic capabilities in the lab were restructured to give a more sensitive measurement. These networks are also looking to renegotiating with Quebec and New Brunswick to do reactor monitoring on a cost-recovery basis.

Harshaw Environmental TLD Monitoring System is undergoing initial calibration, and work has begun on the installation of 3 prototype systems for real time gamma dosimeter measurements, as well as on a simplified method of quantitatively separating strontium from a milk substrate that will greatly reduce cycle times and ensure more accuracy. Calibration has begun for routine analyses of monthly composite stacks of aerosol filters for a prescribed set of gamma emitters.

1.4 *Revision of the Federal Nuclear Emergency Response Plan (FNERP)*

The specific goal is to completely revise the Federal Nuclear Emergency Response Plan (FNERP) to ensure coordination of all federal resources, to effectively interface these resources with Provincial plans and to integrate international assistance.

The revision of FNERP is continuing. A preliminary paper is being prepared on the feasibility of cost recovery for the federal nuclear emergency preparedness program, a draft of the Derived Intervention Levels for Food and Water in the Event of a Nuclear Accident has been prepared and is waiting for internal review, and a survey metre calibration facility is being established according to requirements in AECB Regulatory Document R117 - Requirement for Gamma Radiation Survey Metre Calibration.

2. Environmental Radiation - non-ionizing radiation

Within Environmental Radiation - non-ionizing radiation there are 3 activity areas. In general, the studies in this area involved identification of the hazard and then assessing the risk.

2.1 *Solar UV (Electro-Optics)*

The goal is to produce public information on health risks from solar UV radiation in cooperation with Health Promotion, Active Living, LCDC and Reader's Digest, and develop an assay to measure an individual's sensitivity to exposure and the damage to a particular person.

Environment Canada, Health Canada, and the Canadian Dermatology Association have initiated a joint 2-year research project with the B.C. Cancer Foundation and the Institute of Health Promotion Research of UBC on the Canadian Public Sun Exposure and Protective Behaviours. The development of the "comet" assay to study the effect of solar ultraviolet on the DNA of individual skin cells is proceeding and is scheduled to be ready for routine use in 1996/97. As well, additional public and scientific material is planned for publication.

2.2 *Electromagnetics*

The goal is to assess the effects of electromagnetic fields (EMF), through in-house research and contracts with outside researchers, using a mouse model to shed some light on the effects of 60 Hz fields on cancer initiation, malignant conversion and mutation rate, evaluate the imaging and archiving system for mouse skin tumour studies, assess MF as a tumour promoter/co-promoter, test of MF tumourgenicity, and assess the biological relevance of MF effect on radical recombination. This involved a review of current knowledge, and some collaboration with other international organizations on the WHO Electric and Magnetic Field Project.

The following activities have been completed:

- The histo-pathology of the results of the tumour promotion/co-promotion study is in progress and the results of the experiment to determine the effect of MF on tumour mutation rates in mice are being analysed.
- The triaxial model of magnetic field sensors for measurement of transient fields in selected environments is in the design stage.
- The replication of a short-term bioassay to measure mutation rates in mouse tumour cells in-vivo is planned for 1996/97.
- The imaging system to record and archive mouse skin tumour data is to be tested in 1996/97 tumour studies.
- Various abstracts and papers have been submitted for publication.

2.3 *Acoustics (environmental noise from aircraft)*

The goal is to assess the risk of stress related disease from environmental aircraft noise generated by low level training flights and the take-offs and landings of commercial/civilian jets. This involves a number of research studies including:

- a study involving an aircraft simulation system, using biochemical markers of environmental aircraft noise stress in humans.
- a pilot study on noise stress in rats.
- a pilot study on biochemical markers of noise and housing stress in a rat model .

To be prepared are the guidelines on the assessment and control of the health risks of environmental aircraft noise. Also, there are plans to create a characterized library of flyover events for estimating available exposure conditions and validate the realism of the simulated flyover noise exposure system.

The proposal for a human study is to go before Ethics Committee, the pilot study on biochemical markers of noise and housing stress in a rat model is being replicated, and draft environmental aircraft noise guidelines are partially completed.

Financial Summary

1. Environmental Radioactivity - ionizing radiation

National Calibration Reference Centres

	1992-93	1993-94	1994-95	1995-96
Salary	--	--	--	--
O&M	--	$50,000	$ 76,000	$24,000
Capital	--	--	$183,000	--
Total	--	$50,000	$259,000	$24,000

National Monitoring Network

	1992-93	1993-94	1994-95	1995-96
Salary	--	--	$ 67,000	$121,000
O&M	--	$ 4,000	$ 77,000	$102,000
Capital	--	$266,000	$ 4,000	$217,000
Total	--	$270,000	$148,000	$440,000

FNERP

	1992-93	1993-94	1994-95	1995-96
Salary	--	$ 6,000	--	--
O&M	--	$104,000	$194,000	$183,000
Capital	--	$ 16,000	$ 7,000	$ 13,000
Total	--	$126,000	$201,000	$196,000

Chronic Uranium Uptake

	1992-93	1993-94	1994-95	1995-96
Salary	--	--	--	--
O&M	--	$ 4,000	$ 28,000	$23,000
Capital	--	$266,000	$204,000	--
Total	--	$270,000	$232,000	$23,000

2. Environmental Radiation - non-ionizing radiation

Fiscal Year	Total APHE Budget	Total APHE Expenditures	Difference
1993-94	$140,373	$142,945	($2,572)
1994-95	$100,371	$110,304	($9,933)
1995-96	$261,770	$240,406	$21,364

Clients and Stakeholders

The main clients and stakeholders of this initiative are other Health Canada branches, other federal departments and agencies, provincial governments, research and healthcare facilities, international governments and agencies, as well as the Canadian population in general.

Accomplishments/Outcomes

The major accomplishments of this initiative are as follows:

Ionizing Radiation

- **Updating of National Calibration Reference Centres:** There has been significant revision of the National Calibration Reference Centres. The equipment bought with APHE funds has helped place Canada in the top ten laboratories involved in this type of work. Three (3) papers have been published in scientific journals and 22 technical reports have been produced.
- **Chronic Uranium Uptake:** An important study on uranium in drinking water has just been completed. This is an area in which there was previously very limited human data. The results are in the process of being analysed and there are no

conclusions formulated to date. However, the results will be used to help those involved in setting the guidelines for uranium in drinking water.

- **National Monitoring Network:** Significant steps in modernizing the National Monitoring Network have been made under APHE. Equipment was bought and a major report, *Review of the National Radioactivity Monitoring Network and Reactor Monitor Network (July 1995)*, has been produced. The latter will serve as a "working blueprint" for future direction.

  In addition, ground work for establishing a shared, nation-wide Environmental Radiological Database was begun. This database will serve as a central repository of the environmental radiological data collected by all Canadian jurisdictions and international agencies.

- **Revision of the Federal Nuclear Emergency Response Plan (FNERP)**: Various sections, appendices, and annexes of the revised FNERP have been completed and circulated and a full draft is due for release in October 1996. The revised plan clarifies the roles and responsibilities in the event of a nuclear emergency (the last one was too vague); in particular, it clarifies federal-provincial interaction which did exist in the previous plan.

  A Memorandum of Understanding between Canada and the United States and a Joint Radiological Emergency Response Plan have been completed and signed on July 27th, 1996.

  Health Canada has participated in departmental, inter-departmental and international committee meetings on emergency preparedness and completed two projects to coordinate Health Protection Branch's involvement in major or catastrophic emergencies and conduct a preliminary assessment of the geographic information management needs of the FNERP.

  In addition, a national inventory of radiation measurement capabilities has been completed and Guidelines for Radiological Characteristics in Drinking Water have been approved.

Non-ionizing Radiation

In general, the results of the research studies done to date indicate that more work is needed. However, a number of accomplishments were cited by interviewees:

- **Solar UV:** APHE funds supported the production and distribution of public information pamphlets and HPB Issues papers on the health risks of exposure to solar UV: the re-publication of the pamphlet *"The Sun, Your Baby and You"*; production of an HPB *Issues* on sunglasses; production of a poster of Reducing Health Risks from UV Radiation; production of *"Enjoying the Sun Safely"*, an 8-page insert in the June 1995 issue of Reader's Digest; and, production of the Canada Safety Council's *"Canada Sun Guide"*. In addition, a working group was organized in cooperation with the Canadian Standards Agency (CSA) to propose standards for the labelling of sunglasses. This resulted in the publication of standard CSA-CAN Z-94.3 1995 by CSA in August 1995.

In order to promote the protection of the public from solar UV exposure, a national workshop on Public Education Messages for Reducing Health Risks from UV Radiation was organized and conducted, a paper was presented on *Health Effects of Ultraviolet Radiation*, technical bases for the UV-Index™ MED usage were reassessed, a paper on *"Canadian UV Public Education Program"* was presented at the World Meterological Organization, and the 2nd Symposium on UV-Related Diseases was organized.

An abstract on some aspects of automating the "comet" assay were presented to IEEE Conference on Standards and Measurements in Brussels in 1995.

The communication of scientific information with regard to the health effects related to UV radiation was largely supported under the Healthy Environment Program initiative.

- **Electromagnetic Fields:** A number of abstracts have been produced and two scientific papers have been presented and published: *"EMF Levels from Small D.C. to A.C. Power Conversion Systems"* and *"Assessment of Magnetic Field Exposures from Tape Degaussers"*.

    - The development of an imaging system to record and archive mouse skin tumour data was completed and an abstract was presented at the 1995 annual meeting of the Bioelectromagnetic Society (BEMS).

    - 3 papers have been prepared on the study of the mechanism on interaction between EMF and biological systems. This was a cooperative research with the University of Ottawa. In addition, 1 paper has been submitted for publication in Photochemistry-Photobiology and 1 abstract was presented to the Oxygen Club of California in February 1996.

    - *Issues* on Electric and Magnetic Field Exposure was accepted for publication.

- Technical assistance and instrumentation was provided to outside organizations for the purpose of conducting EMF surveys and made appropriate recommendations for safety. There was, however, no evidence of what these recommendations were.
- Analysis of measured transient magnetic fields from industrial equipment was completed and a scanning system has been installed, tested and used for mapping fields around devices generating EMFs. 2 abstracts were accepted for conference presentations.

- **Acoustics:** A presentation was made for the department at the Goose Bay hearings on low level military aircraft overflights - *"Assessment of Adverse Effects on Humans of Environmental Aircraft Noise Generated by Low Flying Military Training Flights (LFMTF)"*. The presentation included a review of the research done to date in this area and basically concluded that "there is no convincing evidence that exposure to aircraft noise in the area surrounding Goose Bay Airport or in the low-flying training areas, under present or future conditions, causes an increase in the incidence of cardiovascular disease, mental or psychosomatic illnesses or adverse pregnancy outcomes......it is unlikely that people... will incure measurable permanent hearing loss due to environmental aircraft noise from low flying military training flights." The submission further stated that "...it is unlikely that people ... will incur measurable permanent hearing loss due to environmental aircraft noise from low flying military training flights." In addition, Health Canada provided advice to Transport Canada on their new Land Use Compatibility Guidelines and on a draft technical report on the Noise Exposure Forecast measure of community noise. A number of conference presentations have been made but research results are only preliminary.

- One conference paper was presented at the Symposium on Aircraft Noise Abatement Receiver Technology held in Baltimore, Md. in May 1994 on the preliminary aircraft flyover simulation system - *"A Laboratory Study of the Effect of Aircraft Noise on the Human Immune System"*.
- One conference paper, *"A Laboratory Study of Physiological Stress in Humans Exposed to Simulated Military Aircraft Flyover Noise"*, was accepted for Internoise '96.
- This activity area supported the publication of the proceedings of the Noise and Man '93 Conference on Noise as a Public Health Problem.

- databases have been set up for health effects information and journal article abstracts.
- A conference paper was also presented in May 1993 entitled "A review of the effects of noise on the immune system."

Initiative 5: St. Lawrence Health Effects Program

Objectives/description of initiative

The St. Lawrence Health Effects Program was initially submitted for Treasury Board approval as a $5.2 million initiative under APHE. The initiative received $1 million in funding under APHE, and was subsequently merged with a much broader federal/provincial program entitled St. Lawrence Vision 2000 with an additional contribution of $10 million from St. Lawrence Vision 2000 and $6.5 in-kind from the Quebec Ministry of Health .

St. Lawrence Vision 2000 was initiated under an agreement ratified in April 1994 by Environment Canada and the Quebec Ministry of the Environment as a follow on to the St. Lawrence Action Plan. This five-year agreement to conserve, protect and restore the St. Lawrence River will be in place until March 1998. St. Lawrence Vision 2000 is comprised of 7 main components: Biodiversity; Agricultural Clean-Up; Community Involvement; Decision Support; Health; Protection; and, Restoration.

The Health component of St. Lawrence Vision 2000 is the only component of this initiative related to APHE. The Health component's principal objective is to protect the health of people living in the St. Lawrence Basin from the effects of exposure to the contaminants found in the basin. The Health component is jointly co-ordinated by Health Canada and the Quebec Ministère de la Santé ed des Services sociaux.[1]

The goal of this Initiative is to protect human health in the St. Lawrence Basin from the effects of exposure to contaminants in the environment, and study the relationship between the St. Lawrence River and human health and assess the risks of specific contamination. The monitoring of 3 uses of the St. Lawrence River will be conducted: the consumption of fish and seafood, the consumption of drinking water drawn from the river, and recreational uses.

Activities

In 1993, a public consultation was held to establish a basic framework for the health component of St. Lawrence Vision 2000. A coordination committee awarded contracts to various public health research teams. Approximately 26 projects were initiated from 1993 to 1996. Many projects are designed to evaluate contaminant exposure by various population groups. The results of these studies will provide the basis for specific recommendations regarding various uses of the St. Lawrence river.

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[1] Health Component Projects 1993-96, St. Lawrence Vision 2000.

Activities under the health component of Vision 2000 focus on topics such as:

- public awareness of risks of contamination
- populations at risk
- monitoring exposure levels to selected contaminants and related health effects
- monitoring contamination in human tissues
- developing risk reduction strategies

The following activities have been completed:

- Ten Coordination Team meetings were organized and chaired. The Coordination Team and the Health Harmonization Committee merged and formed one group: the Harmonization Committee.
- A communication plan was developed in collaboration with the Health Canada Quebec Regional Office.
- A team was set up to coordinate and produce the ZIP health technical reports. The Quebec City and Saguenay health technical reports were completed and released in the ZIP consultations. The Montreal report was completed.
- An agreement was negotiated with the Province of Quebec leading to a $6.5 in-kind contribution from the Quebec Ministere de la Sante et des Services sociaux.
- An agreement was also negotiated with the Programme National de Recherche de Développement en matière de Santé (PNRDS) and the Fonds de la recherche en santé du Québec (FRSQ) which resulted in an additional $2 million being invested in the establishment of a Knowledge Development Fund which is the first of its kind.
- An overview of water quality in the St. Lawrence has been produced.

Several projects were recently initiated. These include:

- Pilot study on prenatal exposure to organochlorines: Effects on the immune system
- Consumption of freshwater fish in Kahnawake: Risks and benefits

- Detection of the estrogenic potential of environmental contaminants
- Evaluation of the nutrient content of Lake St. Pierre sportfish
- Evaluation of the body burden of chloroform from showering or bathing in municipalities taking their water from the St. Lawrence River
- Analysis of risks to health on the Bécancour industrial port zone
- Reliability/calibration study of the instruments used to measure fish consumption in the Montreal area sportfish studies
- Breast cancer and organochlorines: The role of receptor gene polymorphism

Ongoing projects include the following:

- Male reproductive function and exposure to organochlorines and heavy metals
- Evaluation of prenatal exposure to organochlorines and heavy metals on the North Shore of the St. Lawrence River
- Evaluation of the risks and benefits related to the consumption of Montreal area sportfish
- Descriptive study of cancers potentially related to the St. Lawrence River
- Exposure of the Gulf of St. Lawrence population to organochlorines by the food chain: Biomarkers of genotoxicity and adverse effects on the development of newborns

6 projects were completed:

- Pilot study on organochlorides and endometriosis
- Synthesis of data from programs monitoring sportfish contamination
- Risks related to a contaminant spill in the St. Lawrence River
- Pilot study on the consumption of St. Lawrence River sportfish in Montreal immigrant communities
- Spatial association between the incidence of giardiasis and the quality and method of treatment of water taken from the St. Lawrence River
- Evaluation of the contamination of edible St. Lawrence River seaweed

- Negotiations with PNRDS and FRSQ for the establishment of a Knowledge Development Fund were completed.

Two projects were delayed:

- Evaluation of the consumption of fish among commercial fishermen
- Evaluation of sportfish consumption among sport fishers in the Saguenay region.

Activities which need to be completed are as follows:

- Projects need to be completed, findings analysed, evaluated and publicized.
- Participate in six ZIP consultations and complete technical reports
- Communication of the study results to the Montagnais communities was delayed.
- Hair, blood and urine samples were obtained for various projects to determine the level of specific contaminants in human tissue. The assessment and reports are to be completed.
- The results of the evaluation of public perceptions must be publicized.
- Organize the scientific meeting of 1997 and publish the proceedings of the meeting.
- Implement a communication plan for the health component.
- Develop a risk communication plan after evaluating the psycho-social impacts of contamination in the St. Lawrence.

Financial Summary

Budget 1993/94			
ALLOCATION	SLAP	APHE	FUNDING
PY	3	2	5
SALARY	180	129	309
C.E.B.P.	36	21	57
O & M	260	80	340
CAPITAL	24	20	44
TOTAL	500	250	750

Budget 1994/95

ALLOCATION	SLAP	APHE	ADJUSTMENTS MARCH 24/94	REVISED FUNDING
PY	4	2	(1)	5
SALARY	240	129	(60)	309
C.E.B.P.	48	21	-	69
O & M	1652	230 (280)	(250)	1732 (1692)
CAPITAL	60	20	-	80
TOTAL	2000	500	(310)	2190

Budget 1995/96

ALLOCATION	SLAP	APHE	ADJUSTMENTS FEB. 27, 1995	FUNDING
SALAIRES	240 48	129 21	(63)	306 69
FONCTIONNEMENT	1992	80	(307)	1769
CAPITAL	20	20	-	40
TOTAL	2300	250	(370)	2180

Budget 1996/97					
ALLOCATION	T.B. SUBMISSION	PROGRAM REVIEW FY 95-96	9% HPB REDUCTION APRIL 1994	CAP&HOLD CONTINGENCY MARCH 1996	CONTINGENCY BUDGET
SALARY	240		(60)		270
BENEFITS	48		(12)		54
O & M	2292	(380)	(250)	(125)	1449
CAPITAL	20				0
A BASE	0				0
TOTAL	2600	(380)	(322)	(125)	1773

Budget 1997/98				
ALLOCATION	T.B. SUBMISSION	PROGRAM REVIEW FY 95-96	9% HPB REDUCTION APRIL 1994	CONTINGENCY BUDGET
SALARY	240		(60)	270
BENEFITS	48		(12)	54
O & M	2292	(380)	(250)	1449
CAPITAL	20			0
A BASE	0			0
TOTAL	2600		(322)	1773

Clients and Stakeholders

Target clientele are the populations in the St. Lawrence Basin, the scientific and research communities in the province and local health authorities.

Accomplishments/Outcomes

The published targeted results under the Health component of St. Lawrence Vision 2000 were the following: to assess the risks associated with contaminants by developing indicators of exposure; prepare a report on current knowledge regarding contamination risks to the public; develop and communicate three strategies for reducing risk; monitor contamination of human tissues; and, publish a report on public health in the 20 ZIPs.[2]

The major accomplishments of this initiative are as follows:

- 15 reports were produced.
- Have organized public consultations and have identified priority geographic areas of intervention.
- Have conducted studies on levels of exposure to contaminants.
- Have studied perceptions of health risks by populations.
- Have funded research projects on health risks and benefits.
- A communication plan was developed with the Health Canada Regional Office in Quebec and communication products have been produced for various media (pamphlets, video, public announcements, etc.).
- Have provided funding to community groups to develop knowledge and awareness of environmental health issues.
- A health colloquium was held to provide information on program activities to the Quebec environmental health community.
- A team was set up to produce the ZIP health technical reports. The Québec City and Saguenay health technical reports were completed and released in the ZIP consultations. The Montreal area ZIP report was completed. A table of contents for the ZIP reports was developed in collaboration with the Québec Directions régionales de santé publique.
- Ten Coordination Team meetings were organized. The Coordination Team and the Health Harmonization Committee were merged and renamed the Harmonization Committee. The team participated in other meetings for other SLV2000 components.
- A seminar was held on the pilot phase of the "Exposure of the Gulf of St. Lawrence population to organochlorines" and attended by 60 people.
- A booklet which describes the program's projects was published.

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[2] Biennial Report 1993-1995, St. Lawrence Vision 2000, p.29.

Initiative 6: Environment-Related Disease Surveillance (ERDS)

Objectives/description of initiative

The Environment-Related Disease Surveillance Initiative consists of 2 components: cancer and asthma. The main objectives are to reduce the burden of cancer that may be related to environmental factors through implementation of an enhanced national cancer surveillance system, and to reduce the mortality and morbidity due to asthma, of which environmental factors play an important role.

Activities

Cancer Component

There are four areas of activity within the cancer component:

- Environmental Quality Database

  The Environmental Quality Database (EQDB) was developed to provide easily accessible information regarding environmental quality and potential hazards. Activities under the EQDB focus on the creation of a national inventory of waste disposal sites, an inventory to all estimates of emissions from industries and the collection of data regarding municipal drinking water, water treatment by-products and air contamination.

- Case control

  The objective of the case control is to assess the impact of environmental pollution on cancer risk by collecting data in co-operation with Provincial Cancer Registries regarding newly diagnosed cancer patients and a population control group.

- Geographic surveillance

  Activities focus on methods to detect cancer incidence patterns across Canada and on cluster analysis through the mapping of incidence, in order to identify high risk cancer areas, and by updating the quality of cancer registry data.

- Hot Issue Management

  The goal of hot issue management is to manage specific public concerns regarding the development of certain cancers and environmental risk exposure and develop strategies to identify and address emerging issues.

The following activities have been completed:

- Case Control/EQDB components:

  - A case control proposal was developed in consultation with 10 provincial cancer registries as well as a questionnaire for the component. Individual, residential, occupational and lifestyle data were collected for 18 types of cancers. Risk factor information has been collected for over 11,000 cancer patients and a population control group of 1,000. The case control surveillance is in place in eight provinces and all 10 provinces have committed to participate. Quebec has recently completed an upgrade of its registry that will permit case collection. New Brunswick has not begun data collection.

  - An interactive interface with the Environmental Quality Database has been developed. A data model is being tested with environmental and case control data. The EQDB was developed to include data regarding water treatment and contamination data, air quality estimates as well as detailed air emissions information for large and small industry.

  - A data handling system has been developed, tested and implemented.

  - Automatic postal coding has been accomplished for 85% of residence years. A system has been developed for occupational coding and 27,000 reported occupations have been coded.

  - Several cancer projection papers have been prepared and submitted for publication.

  - The production of environmental quality index for assessment of environmental risks of cancer is behind schedule but is in progress.

  - The potential impact of 8200 municipal dumpsites on groundwater use and municipal drinking water treatment processes have been documented for 3585 communities, representing about 95% of the population.

- Geographic Cancer Surveillance:
  - Preliminary data collection has been completed and cancer incidence data has been mapped. The atlas has been prepared for printing.
  - Studies regarding municipalities with pulp and paper mills have begun.
- Hot Issue Management:

  Support was provided in several areas:

  - The symposium on UV radiation was held in 1992 and a second one in 1996. In 1994 a workshop was held to develop consistent messages and strategies for dealing with UV radiation. Proceedings published in 1994 in the supplement of Chronic Diseases in Canada. The first phase of the study of cancer risks and tanning equipment has been completed.
  - Facilitated feasibility study of a large-scale community-based environmental health study in Sydney, N.S. An advisory panel has been established to provide direction in protocol development for the main study.
  - Case-control risk assessment of *trihalomethanes (THMs) in drinking water* in the Great Lakes basin and colon, bladder, kidney cancer in collaboration with the Ontario Cancer Treatment and Research Foundation (OCTRF) and Environmental Health Directorate. Provincial medical officers of health and all medical officers of health in Ontario were notified of the results and conclusions of the study.
  - A pilot study of *uranium in drinking water was conducted to assess renal disease.*
  - Facilitated feasibility study and held workshop in October 1995 on *organochlorines and breast cancer* to determine direction for main study currently underway.
  - Provided data in response to community hot issue - increased rates of *mesothelioma in Sarnia area,* demonstrating need for further investigation.

Activities which need to be completed are as follows:

- Cancer Case Control/EQDB:
  - This component is still in the data gathering stage. A total of 20,000 questionnaires from cancer patients and a control group of 5,000 will be completed and entered into the database by next March.
  - Analysis regarding the impact of identified hazards on the development of specific cancers. Analysis is underway to evaluate specific activities related to chlorinated by products in drinking water.
  - Risk evaluation must be produced regarding the relation of specific cancers to air and water quality concerns.
  - Environmental health hot spots need to be identified.
  - The development of the EQDB and the expansion of the database inventory must be continued.
  - The coding of 75,000 reported occupations must be completed.
- Geographic Cancer Surveillance:
  - Preliminary data collection has been completed. The focus of the component is now on the analysis stage.
  - The national cancer incidence atlas must be distributed and the ranking of Census Division for major cancer sites must be analysed.
  - The identification of cancer risk clusters and potential determinants must be made.
  - Analysis of pulp and paper municipalities' exposure to air and water quality to establish an incidence record must be completed.
- Issue Management:
  - Ongoing risk assessment studies, risk management activities and communications must be conducted for current and emerging specific activities associated with environmental hazards for example, radiation and thyroid cancer.
  - Continued development of a network to provide the Department with answers to deal with environmental hot issues.

Asthma Component

Activities under the Asthma Component can be grouped into three main categories:

- National Asthma Surveillance

  This includes the establishment of a national asthma surveillance database to monitor the impact of asthma, collection of new data on asthma prevalence and incidence, severity, risk factors, drug use, medical and health services use and treatment. This information will allow better understanding of asthma mortality and morbidity trends and facilitate the planning, implementation and evaluation of effective asthma preventive and control measures.

- Targeted Risk Assessment

  In collaboration with researchers, an epidemiologic study has been conducted to identify risk factors for fatal and near-fatal asthma. This information will allow LCDC and other stakeholders to implement effective strategies to prevent unnecessary asthma deaths in Canada.

- National Asthma Control Strategy

  A National Task Force represented by stakeholders and interest and consumer groups in this area has been established to develop a "National Strategy for Asthma Control". The national asthma control goals and objectives have been established and strategies to achieve these goals and objectives are being formulated. Physician and patient asthma education projects aimed at reducing the impact of asthma are also underway.

The following activities have been completed:

- Several studies have been initiated. For example, the Asthma Incidence and Prevalence Study is ongoing in several provinces in order to measure the association between asthma and risk factors in different parts of Canada. Studies in Manitoba and Alberta have been completed.
- A four-year fatal asthma study in the Prairie provinces to identify risk factors associated with asthma mortality is near completion. The findings will assist to formulate strategies to reduce asthma deaths in Canada.
- A national survey of family physicians will provide a better understanding of the asthma management practices among physicians.
- The Public Health Unit Consultation Workshop has been implemented.

- The final report of the PEI component of the Adult Asthma Surveillance Study has been completed.
- An Asthma Surveillance Database has been established. Asthma information is now provided on request.
- Preliminary data collection of asthma drug utilization has been conducted.
- Preparation work such as the survey protocol and the questionnaire for the asthma component of the National Population Health Study has been completed.
- The National Asthma Control Task Force was established. The group established the National Goals and Objectives and formulate strategies to achieve these goals and objectives.
- The design for the Physician Asthma Management Survey has been completed. The project results will provide valuable information for LCDC and other stakeholders in the planning, implementation and evaluation of effective asthma prevention and control activities in Canada.
- Two "National Conferences on Asthma and Education" in 1993 and 1995 were co-sponsored with the Canadian Network of Asthma Care (CNAC).
- The "Multiple Chemical Sensitivities and Their Relevance to Psychiatric Illnesses Workshop" in 1992 was co-sponsored. This workshop will help educate professionals and patients on MCS and explore research directions.
- Two asthma patient education initiatives are in progress in collaboration with the CNAC.
- Published the Canadian Asthma Management Guidelines for educating physicians on appropriate care of asthma patients.

Activities which need to be completed are as follows:

- Surveillance on asthma needs to be continued to monitor trends and to effect appropriate prevention and control measures
- Data collection on prevalence and incidence of asthma and related factors.
- The collection of information and analysis relating to asthma drug utilization and treatment practices must be continued.

- Preliminary discussions are to be conducted with physicians regarding the Physician Asthma Management Study. Field work is to begin.
- Field work for the National Population Health Survey must be completed.
- Asthma treatment guidelines will be implemented in order to facilitate asthma education for health professionals in Canada.
- Implementation of strategies to achieve the asthma prevention and control goals formulated by the National Asthma Control Task force.

Financial Summary

	91/92	92/93	93/94	94/95	95/96	96/97
TB Approval Operating	775	1,345	2363	1,510.6	2,433.9	2,613
Reprofiled Allocations, overhead and cuts	75	473.1	1,300.1	886.4	469.9	1,270.5
Total revised operating	700	871.9	1,062.9	1,510.6	1,964.1	1,342.5
Operating expenditures - Cancer	365	496.9	662.9	1,132.2	1,477.1	989.3
Operating expenditures - Asthma	335	375	400	378.4	487	23.4
Total Operating Expenses Including overhead & cuts	700	1,345	2,363	2,397	2,433.9	492
Salary Allocation	78	174	247	335	428	515
Reprofiled allocations overhead and cuts				123	53.9	
Salary Expenditures	78	174	247	212	376.9*	452*
Capital Allocation	235	153	150	114	90	90
Reprofiled allocations, overhead and cuts	225	13	37.5		9	43.7
Capital Expenditures	10	140	112.5	114	81	46.3
Total APHE	**1088**	**1,672.0**	**2,760.0**	**2,846.0**	**2,951.0**	**3,2180.0**

*anticipated expenses

Clients and Stakeholders

Target clientele include internal Health Canada clients, other government departments (Federal and Provincial), the scientific community, provincial cancer registries, asthma patients and physicians, and the Canadian population as a whole with regard to health protection are the stakeholders of the Air Health Effects Program.

Accomplishments/Outcomes

The major accomplishments of this initiative are as follows:

Cancer component

- The development of an Enhanced Cancer Surveillance System.
- The creation of a Geographic Information System to track cancer incidence. This system translates incidence data into on-screen maps which geographically identify high incidence areas.
- The undertaking of case control processes on provincial cancer registry data. The Case-Control Database adds major enhancements to surveillance activities, allowing comparison and evaluation of mobility, latency and control of other important lifestyle factors.
- The development of an Environmental Quality Database (EQDB) which includes a large inventory of air and water quality data synthesized from many sources of public information. It also includes an inventory of major and minor sources of pollution (e.g., waste dumps, industry, water treatment, etc.).
- Provision of support for Hot Issues Management.

Asthma component

- The publication of guidelines under the "Canadian Asthma Consensus Conference".
- The creation of a national asthma surveillance database. The data will allow the monitoring of the impact of asthma in Canada and conduct an evaluation of the impact of asthma prevention and control program activities.
- The completion of a major risk assessment study on asthma and the production of scientific evidence on treatment methods.
- The support of the national Asthma Control Task Force.

- New information was obtained on the prevalence of asthma and its risk factors among adults in Canada through the Adult Asthma Surveillance Study. Similar information has been obtained for children through an LCDC Brighter Futures-funded initiative.
- Six books and forty-eight reports have been published, twenty-two articles have appeared in scientific journals. Information has been disseminated to the public via information packages, information sheets, circulars and newsletters.
- 20 collaborative workshops have taken place since 1991 and presentations have been given at more than 19 conferences since 1993.

Initiative 7: Market Basket Survey (MBS)

Objectives/description of initiative

The Market Basket Survey is conducted to measure the actual exposure of Canadians from food to a host of environmental organic and inorganic contaminants and agricultural chemical residues. The goal of the project is to "produce baseline data on pesticide, contaminant and metal content of the Canadian food supply as it is consumed. The data collected and analysed is an indicator of the quality of the food supply and is used to calculate intakes of the measured chemicals by the consuming public."

Food will be sampled from two Canadian urban centres per year and prepared as for consumption. Pesticides and trace elements will be determined in these composite samples. The data for elemental analysis of composites from all regions will be analysed and tabulated. A methodology will be developed to expand the scope of the chemicals determined.

Activities

Prior to 1993:

- Sampling of the Toronto area was completed and 136 composites were prepared (contract with Kemptville Agricultural College). Selenium was analysed in 136 composites from Toronto, and lead (Pb) and Cadmium (Cd) analyses are approaching completion.

1993-94

- Data and sampling analysis continued in 1993-1994. Sampling of the Montreal and Halifax regions were completed and 272 food composites were prepared through a contract with Kemptville Agricultural College.
- The analysis of 90 composites from the Toronto region and of 84 composites from the Montreal region for organochlorine and carbamate pesticides were completed in the summer of 1992.
- Several multiresidue methods were studied to expand the scope of the post harvest fungicides and iodine determinations on Toronto composites were completed.
- Elemental analysis of Montreal composites were initiated in the summer of 1993.

- Evaluations were completed with data from lead, cadmium and selenium analyses of Toronto samples and the report: *"Analytical Report on Lead, Cadmium and Selenium in APHE Food Composites"*, R. Dabeka, October 1993, was prepared.

1994-95

- The sampling and composite preparation of Winnipeg and Vancouver regions were completed.
- Multiresidue pesticide analysis of Toronto, Montreal and 80% of Halifax samples were completed.
- Carbamate analysis of Winnipeg samples completed. Organochlorine and PCB congener analysis completed for Toronto, Montreal, Halifax and Winnipeg samples.
- Analysis of Toronto and 50% of the Montreal samples for dioxins, furans, and coplanar PCBs were completed.
- The pesticide multiresidue methodology was included to include an additional 11 compounds.
- The analysis of Montreal, Halifax and Winnipeg for Mg, Al, Cu, Zn, Sr, Ba, Rb, Cs and Pb were completed.
- The analysis of Toronto composites were initiated.
- Iodine data was evaluated and the report, *"Report on Selenium and Iodine Levels in Total Diet Samples"*, R, Dabeka, September 1994, was prepared.

1995-96

- Sampling and composite preparation of Ottawa and Toronto were completed.
- The food intake table was completed and the manuscript was prepared for publication listing the food intakes and the techniques used to estimate the dietary intakes of contaminants.
- The data was applied to the Iodine and Selenium data and estimated the dietary intakes of these elements were estimated.
- Elemental analysis of Winnipeg and Vancouver composites were completed.

- Dioxin/furan/coplanar PCB analysis of 30 samples of total diet composite from Montreal, ten samples from Vancouver, 22 from Winnipeg and 3 from Halifax have been successfully analysed

- The analysis of Halifax, Winnipeg and Vancouver samples for organophosphate and organochlorine pesticides was completed.

- The analysis of Vancouver and Ottawa samples for PCB cogeners and organochlorine pesticides was completed.

- Studies were initiated on the determination of phthalates (primarily DEHP) in total diet samples using GC-MSD. However, laboratory environment/reagent blanks for DEHP were unsatisfactory and the analysis was suspended.

1996/97

The following activities are planned:

- To complete the elemental analysis of Ottawa and Toronto (1996) composites. Evaluate data and prepare a report for publication.

- To initiate the analysis of one set of composites for mercury.

- To complete the analysis of samples from Vancouver and Ottawa for dioxins/furans/ coplanar PCBs.

- To complete the analysis of Toronto and Ottawa composites for organophosphates, carbamates, organochlorine pesticides and PCBs. Analyse data from 1992-96 samples and prepare publications. Expand the scope of the multiresidue method to include an additional 10-15 compounds in preparation for continuation of the Total Diet program in 1998.

- To develop a methodology for DEHP determination in fatty foods and infant formulas and apply to respective composites.

Financial Summary

Fiscal Year	Allocated	Spent	Unspent
1993/94	$306,000	$305,994	$6
1994/95	$442,200	$412,558	$34,642
1995/96	$232,000	$220,742	$11,258
1996/97	$338,521*		

* includes $111,000 to Ontario Region

Clients/Stakeholders

Target clientele are the Canadian public in general, northern health agencies, First Nations and Inuit, people living in the North, as well as other branches in Health Canada.

Accomplishments/Outcomes

Data collection and analysis is currently ongoing. The provision of information on contaminant levels in foods (i.e., generation of baseline information on pesticide, contaminant and metal content of the Canadian food supply as it is consumed) and the development of research methods and heightening of sensitivity of detection are the major achievements of this initiative.

The Market Basket Survey Initiative outputs to date include:

- 6 Reports and Technical Papers
- 2 Manuscripts in Preparation
- 4 Invited Presentations
- 2 Unsolicited Presentations at Conferences
- 1 Book Chapter

Initiative 8: Drinking Water Safety Program for Native People (DWSPNP)

Objectives/description of initiative

The Drinking Water Safety Program for Native People has four main objectives: To increase sampling and analysis of existing drinking water supplies for chemical and bacteriological qualit; to provide advice to First Nations and DIAND on the design, maintenance and operation of community water systems; to develop a training package for First Nations water treatment plant operators; and, to promote the importance of having a potable water supply through various educational materials.

Activities

The following activities have been completed in 1994-1995:

- The First Nations Water Treatment Plant Operators Circuit Rider Training Program has been implemented in 13 First Nations communities in Northern Ontario.
- A basic mathematics concept course, as well as an occupational health and safety workshop has been given to First Nations water treatment plant operators in Northern Ontario.
- Baseline chemical analysis continued and was completed in Atlantic, Ontario and Prairie Regions
- Quality control has been maintained with the laboratories which are analysing MSB's water samples.
- The West Region Tribal Council has expanded their self-sufficient water quality monitoring program, using Presence/Absence techniques. They have also developed and presented a public education program regarding the importance of safe drinking water.
- The drinking water database system has been implemented in all of Prairie Region.
- A national technical workshop was held in Toronto. Technical presentations were given and participants also had the opportunity to discuss a variety of issues.

- An awareness video "The Creator's Gift" has been produced.
- The Split Lake Cree First Nation has established a training centre for Presence/Absence testing. The community has had 3 training sessions in which 12 communities participated.
- A Presence/Absence video has been produced and presented to a number of First Nations communities. A Presence/Absence training video has also been produced, which is distributed to First Nations trainees once they have completed the Split Lake course.
- Tribal Councils in Saskatchewan have established and are maintaining a data collection system for community water system profiles and water quality.
- A Native Water Treatment Plant Operators Association was formed in Ontario to aid operators with technical information, training and advances in water treatment.
- A community profile exercise was performed across the country, and the data is in the process of being added to a computerized database at Headquarters. This database contains information regarding community water and sewage systems as well as general community data.

Specific goals for 1995-96 include:

- The continuation of the national QA/QC program.
- The implementation of the Drinking Water Database program.
- The implementation of Presence/Absence programs.
- To provide training to First Nations water treatment plant operators.
- To increase awareness of the importance of safe drinking water.

Specific goals for 1996-97 include:

- The implementation of the Circuit Rider Training Program in Atlantic, Quebec, Manitoba, Alberta and B.C.
- The implementation of additional Presence/Absence laboratories in First Nations Communities.

- The working committee identified three primary tasks to be worked on during the upcoming year:
  - Identifying examples of how First Nations were already protecting and enhancing the quality of their drinking water.
  - Identifying different ways that the federal government works with First Nations to protect and enhance the quality of their drinking water.
  - Identifying existing legislation that could be or is being used to protect and enhance the quality of First Nation communities drinking water.
  - The Assembly of First Nations is responsible for the first and third tasks, while Health Canada and DIAND will be responsible for the second task.
- Work will continue on the water quality database; continued capture and analysis.

Financial Summary

The following tables summarize the APHE budgets and expenditures for FY92/93 to FY95/96.

APHE Allocations - 1992/93 ($000s)

DWSPNP	Original Allocation	Allocation After Transfers	Expenditures	Variance
Salary	900.0			
HQ		260.9	271.6	43.3*
Regions		284.1	219.4	64.7
O&M	1,591.0			
HQ		786.0	620.9	105.1*
Regions		605.0	586.8	73.2
Contributions	470.0			
HQ		665.0	653.1	11.9
Regions		20.0	0.0	20.0
Capital	200.0			
HQ		17.2	16.4	0.8
Regions		383.6	239.1	101.4
Total	3,161.0			
HQ		1,727.1	1,508.0	161.1
Regions		1,292.9	1,045.3	259.3
Grand Total	**3,161.0**	**3,022.0**	**2,553.3**	**420.4**

* Advised by DG to withhold $30K from salary and $40K from O&M for budget cut.

APHE Allocations - 1993/94 ($000s)

DWSPNP	Original Allocation	Allocation After Transfers	Expenditures	Variance
Salary	1,293.0			
HQ		200.1	194.5	5.6
Regions		455.1	419.2	35.9
O&M	990.0			
HQ		417.2	396.1	21.1
Regions		849.9	708.5	141.4
Contributions	470.0			
HQ		588.6	557.7	30.9
Regions		220.6	211.9	8.1
Capital	200.0			
HQ		--	--	--
Regions		265.4	309.8	(44.4)
Total	2,953.0			
HQ		1,205.9	1,148.3	57.6
Regions		1,790.4	1,649.4	141.0
Grand Total	**2,953.0**	**2,996.3**	**2,797.7**	**198.6**

APHE Allocations - 1994/95 ($000s)

DWSPNP	Original Allocation	Allocation After Transfers	Expenditures	Variance
Salary	1,579.0			
HQ		209.0	178.4	30.6
Regions		812.1	605.7	206.4
O&M	2,551.0			
HQ		537.4	484.9	52.5
Regions		1,082.3	827.9	254.4
Contributions	495.0			
HQ		751.7	750.9	0.8
Regions		1,164.0	1,082.7	81.3
Capital	200.0			
HQ		44.0	43.2	0.8
Regions		336.0	318.8	17.2
Total	4,825.0			
HQ		1,542.1	1,457.4	84.7
Regions		3,394.4	2,835.1	559.3
Grand Total	**4,825.0**	**4,936.5**	**4,292.5**	**644.0**

APHE Allocations - 1995/96 ($000s)

DWSPNP	Original Allocation	Allocation After Transfers	Expenditures	Variance
Salary	1,544.0			
HQ		167.5	172.9	(5.4)
Regions		817.0	734.9	82.1
O&M	2,998.0			
HQ		478.3	472.7	5.6
Regions		957.7	920.8	36.7
Contributions	796.0			
HQ		548.7	542.3	6.4
Regions		2,515.6	2,491.7	23.9
Capital	200.0			
HQ		23.3	21.9	1.4
Regions		150.0	161.6	(11.6)
Total	5,538.0			
HQ		1,217.8	1,209.8	8.0
Regions		4,440.1	4,309.0	131.1
Grand Total	**5,538.0**	**5,657.9**	**5,518.8**	**139.1**

Clients and Stakeholders

Target clientele are the First Nation populations in those communities participating in this program. Other stakeholders include the Department of Indian Affairs and Northern Development, International Research and Development Council (IRDC) and the Assembly of First Nations.

Accomplishments/Outcomes

Identifiable results are categorized under the three main goals:

- To increase drinking water quality monitoring
    - Baseline chemical analysis continued and was completed in Atlantic, Ontario and Prairie Regions

- Quality control has been maintained with the laboratories which are analysing MSB's water samples

- The West Region Tribal Council has expanded their self-sufficient water quality monitoring program, using Presence/Absence techniques.

- The drinking water database system has been implemented in all of Prairie Region.

- Tribal Councils in Saskatchewan have established and are maintaining a data collection system for community water system profiles and water quality.

- A community profile exercise was performed across the country, and the data was added to a computerized database at Headquarters. This database contains information regarding community water and sewage systems as well as general community data.

- Community-based laboratories which monitor the microbiological quality of drinking water have been established in over 150 First Nation communities

- The Split Lake Cree First Nation established a training centre for Presence/Absence testing. The community has had 3 training sessions in which 12 communities participated.

- A Presence/Absence video had been produced and presented to a number of First Nations communities. A Presence/Absence training video has also been produced, which is distributed to First Nations trainees once they have completed the Split Lake course.

- To provide training to First Nations water treatment plant operators

  - The First Nations Water Treatment Plant Operators Circuit Rider Training Program has been implemented in 13 First Nations communities in Northern Ontario.

  - A Native Water Treatment Plan Operators Association was formed in Ontario to aid operators with technical information, training and advances in water treatment.

- Water Treatment Plant Operators Circuit Training Program has been implemented. Fifty-five individuals completed the training program between January 1 and December 31, 1995.

- To provide advice to First Nations and Department of Indian Affairs and Northern Development on the design, operation and maintenance of water systems in First Nation communities

  - An awareness video "The Creator's Gift" has been produced.

  - A Water Treatment Plant Operators Committee, consisting of representatives from Health Canada, DIAND, AFN and various First Nations Communities, was formed and meets on a regular basis.

The scientific research conducted includes:

- Chemical Sampling: A baseline sampling program was completed in 1994. Over 1000 community water supplies were tested for a list of 56 chemical and physical parameters. Other chemical sampling projects were initiated in various First Nations communities across the country. They included watershed studies, sampling of water storage tanks, cottage lease surveys, testing for hydrocarbons, pesticides and THMs.

  The results indicate that approximately 10% of the water systems had exceedences of aesthetic parameters, while 5% had exceedences of health parameters. The results have been entered into a database for later reference. Reports have been presented to all communities which participated in their national baseline survey. The reports illustrate the results, as well as identify the exceedence and potential sources, health effects and treatment for the parameter(s) in question.

- Bacteriological Sampling : The Split Lake Cree First Nation developed a training program based on bacteriological sampling. The Presence/Absence test, a bacteriological test, was selected because it is inexpensive, reliable, and very straight-forward. The Split Lake Cree First Nation, who had been utilizing the Presence/Absence Test for years, agreed to set up a training centre in their community and invite First Nations from across the country to attend their training program.

- Publications/Seminars/Conferences:
  - A national technical workshop was held in Toronto. Technical presentations were given and participants also had the opportunity to discuss a variety of issues.
  - Through a second contribution agreement with the AFN, as second round of consultation sessions was held. The product of these sessions was a set of recommendations, which are to become part of the national strategy/direction of the Drinking Water Safety Program for Native People.
  - A national meeting regarding the Drinking Water Safety Program was held on July 14-15, 1993 in Ottawa. Representatives from all Regions and the AFN attended. A work plan was developed for the remainder of fiscal year 1993/94.
  - Two Public Health Engineers meetings have been convened to address Health Canada's input to DIAND's "Priority Rating of Infrastructure Projects" policy paper.
  - A national meeting for Drinking Water Safety Program for Native People was held March 8-10, 1994, in Edmonton. The purpose of this meeting was to review past activities and to define priorities/activities for fiscal year 1994/95.
  - Four Community Health Representative workshops on water were held in Alberta. The focus was on the importance of drinking water sampling programs in First Nations communities. Sixty participants attended.
  - The West Region Tribal Council has developed and presented a public education program regarding the importance of safe drinking water.
  - A national technical workshop was held in Toronto. Technical presentations were given and participants also had the opportunity to discuss a variety of issues.

The extent of participation of Aboriginal Canadians in the Initiative is as follows:

- Over 1,000 First Nation community water systems participated in the water supply survey.

- The West Regional Tribal Council implemented a WQP for its seven member First Nations: Ebb & Flow, Gamblers, Keeseekoowenin, O-Chi-Chak-Ko-Sipi, Pine Creek, Rolling River and Waterhen. The purpose of the initiative was to provide training, education and water sampling. The education program and the contact person has improved communications between the WQP and First Nation membership. Monitoring, adjusting and maintaining WTP chlorine levels; prompt notification; and First Nation response to clean and disinfect cisterns, wells, barrels and WDV's has greatly improved.

- In 1993 a Water Treatment Plant Operators (WTPO) Committee was established to address long standing needs of First Nation water treatment plant operators. Over the following year, the WTPO Committee proceeded to develop a circuit rider training program and secure funding of it. Permission was obtained from the Saskatchewan Water Corporation to adapt their training manual for use in the Ontario Pilot Project. The Ontario Pilot Project is turning out to be quite successful. The operators have been most receptive to training. The commitment of communities and their operators is being demonstrated in many ways, such as:

    - First Nations purchasing water testing equipment, safety equipment and spare parts at their own expense for their operators;

    - Operators attending each training session provided by the trainers in their community, as well as, the group sessions held elsewhere;

    - Operators pursuing their own studies, for example, in math, to improve their job performance or duties; and

    - A willingness on the part of operators to continue training sessions into the evening hours.

The extent to which First Nation community water systems are in compliance is as follows:

- The federal government has been working with First Nations to ensure that community water and sewage systems meet federal guideline for drinking water and sewage effluents. The *Community Drinking Water and Sewage Treatment in First Nation Communities* survey was undertaken to assess the current status of First Nation water and sewage systems, the progress that has been made to meet the guidelines and the work that remains to be done.

  The results of the survey indicate that of the 863 community water systems examined, 20% (171) have the potential to affect the health and safety of the community if problems are not addressed. Another 5% (40) of the community systems are in need of repair or improved maintenance as they could pose a health risk to the community should they malfunction before the problem is addressed. Of the 425 community sewage treatment systems examined, 9% (39) are experiencing problems that could potentially affect the health and safety of the community. Another 6% (25) of the community systems were in need of equipment repairs or improved maintenance practices, and could pose a health risk if a malfunction were to occur.

- A baseline chemical sampling program was completed in 1994. Over 1,000 community water supplies were tested for a list of 56 chemical and physical parameters. Approximately 10% of the water systems had exceedences of aesthetic parameters, while 5% had exceedences of health parameters. Reports have been presented to all communities which participated in the national baseline survey.
- In terms of trends in compliance, 6 operational water treatment laboratories were visited by Health Canada, and all were found to be very clean, with good lab hygiene and adequate quality control. This was attributed to the training program developed by the Split Lake First Nation. This training program was successful in providing WQ technicians with the basic knowledge and skills necessary to establish a functional laboratory and correctly perform the water quality tests.

The following are other accomplishments of the Drinking Water Safety Program for Native People.

- This initiative also established a database. A contract with Carleton Writing Consultants produced a user-friendly software manual for the drinking water database. The database is administered by regional authorities. Overall compliance rates are not available at present as the responsibility for the monitoring of compliance rests with the regions.
- Through this initiative, health risks to the Natives from their environment were identified. Over 1,000 community water supplies were tested for a list of 56 chemical and physical parameters. The information with respect to the findings were relayed to the communities which participated in the national baseline survey. The reports illustrated the results, as well as identifying the exceedences and potential sources, health effects and treatment for the parameters in question.

Additional follow-up sampling is being completed for water supplies where exceedences did occur.

As an example, through the baseline survey, a "potential" uranium problem was uncovered in the drinking water of a First Nation Community. A contribution agreement allowed the community to perform their own sampling, pinpoint the problem and make recommendations to Indian and Northern Affairs regarding treatment options. Uranium is no longer a problem in this community. A health study is under way in the community to examine the potential bio-effects of exposure to elevated levels of uranium.

- Partnerships were developed with Aboriginal Canadians as a result of this initiative. In early 1993 the Assembly of First Nations, other First Nation groups, the Department of Indian and Northern Affairs and Health Canada entered into a partnership agreement to develop an adequate long term training program for the operators of water treatment facilities. To this end, circuit rider training program, based on a Saskatchewan model was developed and is being piloted in 13 communities in Northwestern Ontario. The program has been enthusiastically received by First Nations, and plans to expand it nationally are now underway. The Ontario First Nations Technical Services Corp. will now be managing the training program in Ontario and financial support will be forthcoming from DIAND. The program has been embraced by First Nations in Manitoba. The West Region Tribal Council will be custodians of the program, and DIAND will provide financial assistance.

  Other partnerships that have been developed include:

  - Through an agreement with Pictou Landing Micmac, the Joint Environmental and Health Monitoring Committee has been established. Through this initiative, HC is sharing the cost with DIAND for the installation of the Pictou Landing monitoring wells.
  - A joint project with Environment Canada has continued, which deals with groundwater/drinking water safety in New Brunswick.
  - Three contribution agreements were signed with various Tribal Councils in Saskatchewan so they could establish and maintain a data collecting system for community water system profiles and water quality.
  - Discussions with DIAND and Environment Canada have revised the MOU which defines the mutual technical objectives and working

relationships. Regional Environmental Health Officers and Public Health Engineers have provided their input into the process through workshops and correspondence.

- A contract with the National Water Research Institute produced a document with recommendations on how to set up a national QA/QC monitoring program.
- Through a contract with Saskatchewan Water Corporation, four First Nations water treatment plant operator workshops were held across Alberts. The focus was on disinfection processes for drinking water. A total of 75 operators attended all four workshops.
- Under a contribution agreement, the AFN conducted an initial round of consultation sessions with First Nations, which were held nationally in order to identify and prioritize the needs of First Nations communities in relation to the Drinking Water Safety Program.
- A contract with the Technical University of Nova Scotia (Centre for Water Resource Studies) produced the document entitled "Appropriate Technology for Water Quality Monitoring at Remote Sites." This document is a complete summary of current technology available for chemical and bacteriological monitoring of drinking water in remote areas.
- A Water Treatment Plant Operators Committee, consisting of representatives from Health Canada, DIAND, AFN and various First Nations communities, was formed and met on a regular basis.

Initiative 9: Effects on Aboriginals from the Great Lakes Environment - Project Eagle

Objectives/description of initiative

The objective of this initiative is to blend community and scientific knowledge in a partnership between the AFN, MSB and 63 First Nation (FN) communities from the Great Lakes Basin to examine the effects of contaminants on the health and well being of the Great Lakes Native populations. There are two Principal Investigators, one First Nations Individual and one Health Canada (MSB) representative.

The EAGLE program is delivered jointly by Medical Services Branch (MSB) and the Assembly of First Nations (AFN). EAGLE's coordinating office at AFN in Ottawa is responsible for the day-to-day management and coordination of all Project activities. Health Canada's Medical Services Branch provides biostatistical, analytical, and scientific support services to the EAGLE Project. The project employs seven full-time staff within the Environment Unit of the AFN. 4 of these 7 PYs are in the four regional offices which are responsible for: data collection; community outreach; education and awareness; implementing and organizing the EAGLE programs; and providing assistance and advice to the communities (a population of approximately 100,000).

Activities

There are six major areas of activity within this initiative:

Eating Pattern Survey

Begun in May 1992, the survey provides information on the consumption of freshwater fish and wild meat by community members (e.g., data on species consumed, portion size, portion consumed, harvesting sites and community demographics). The survey covered 32 of the targeted 61 First Nation communities, representing a population of over 1,300. Sub-components included a pilot project, recalls on fish consumption, a model estimation experiment, retest analysis and analyses of consumption patterns.

Fish Contaminant Project

The project was intended to determine the levels of contaminants in fish and wild game consumed by First Nations people for which existing data from the Ontario Ministry of the Environment and Energy was inadequate. In collaboration with the OMOEE, EAGLE has developed community-specific fish consumption guidelines. This involved collecting over 600 individual samples of 11 different species of fish among 12 of the 19 communities that participated in the Eating Patterns Survey in 1993.

Contaminants in Human Tissues Program

This component involved analysing samples of blood for over 40 different PCB congeners, 35 organochlorine contaminants; and hair samples for mercury. The blood sampling program was expanded to include 205 people in eleven communities.

Health Survey

The Health survey will be used to assess the health status of First Nations communities and relating it to environmental quality. Field work started in the fall of 1995. It has been completed or is underway in 26 communities. A modified version of the Ontario Health Survey is used to collect the data which is to be compared to geographic counterparts from the Ontario data. Statistical work will be performed on this data to provide good morbidity and mortality data, which was found to be lacking.

Socio-Cultural Program

This program is intended to identify and measure Socio-cultural "quality of life" indicators of health and well being in communities. The methodology is blending knowledge and information from Elders and other community members with the standard information that is collected in epidemiological studies. The approach is being pilot tested in four communities.

Geographic Information System

This system is being used to display and analyse traditional knowledge and scientific information on First Nations health and environment. Work in 1995 focused on completing the base map for the entire basin.

Regional Activities

The project has close ties with the MSB Ontario Region. The Environmental Health Officers (EHOs) in the project areas utilize the EAGLE Regional Representatives whenever possible, especially on complex issues.

There are links with the Prairie and Pacific Region's Medical Services Branch's Occupational and Environmental Health Services and Indian Health Services, as well as the Governments of Ontario, B.C., Alberta and the North West Territories. Activities are centred on training and education, building awareness, and developing community-based strategies and tools.

The status of these initiatives are as follows:

- The wild meat contaminants data is still being worked on as there is no large database in this area. Not a large number of samples have been collected due to a late start and the missing of the latest hunting season.
- Hazards cannot be identified until after the eating patterns surveys are completed and analysed, the fish and wild meat data is collected, reformatted and analysed, and remaining gaps in the fish data and wildmeat data are filled.
- Discussion continued with Walpole Island on the Pilot "Exposure Plus Study". Negotiations evolved into the area of human breast milk study. Georgina Island was being considered as another First Nation community to negotiate with for such as study.
- The two main priorities for 1996-97 are:
    - consolidating, synthesizing, and producing final reports on research activities; and,
    - ensuring that results and information are transferred to First Nations communities.
- There is a need to continue project activities for an additional two years because some of the more personal and potentially intrusive programs could only be initiated during the last two years.
- Some communities which have not yet participated in the research programs now have a strong interest in being involved. In 1995/96, 5 new communities agreed to participate, and a total of 230 responses have been obtained.
- There is also a need to further strengthen the capacity of First Nations communities to deal with environmental and health concerns more effectively in their on-going effort towards self-government.
- Community/grassroots work and education/awareness work will be used to make First Nations aware of the pollutants they are facing in "country foods" they are eating, as soon as all of the data is fully available. This is part of the continued progress towards the ultimate goal of providing enough information to the First Nations about making the most informed decisions regarding the consumption of "country foods".

Financial Summary

The tables below summarize the MSB APHE Budgets and Expenditures for FY92/93 to FY95/96.

1992/93 ($000s)

EAGLE	Original Allocations	Allocations After Transfers	Expenditures	Variance
Salary	172.0			
HQ		99.3	99.3	0.0
O&M	301.0			
HQ		130.0	77.8	52.2*
Contributions	400.0			
HQ		571.0	570.6	0.4
Capital	50.0			
HQ		50.0	49.3	0.7
Total	923.0			
HQ		850.3	797.0	53.3
Grand Total	**923.0**	**850.3**	**797.0**	**53.3**

* Advised by DG to withhold $30K for the budget cut.

1993/94 ($000s)

EAGLE	Original Allocations	Allocations After Transfers	Expenditures	Variance
Salary	222.0			
HQ		135.8	119.0	16.8
O&M	176.0			
HQ		150.7	129.8	20.9
Contributions	400.0			
HQ		567.0	551.0	16.0
Capital	50.0			
HQ		5.0	4.8	0.2
Total	848.0			
HQ		858.5	804.6	53.9
Grand Total	**848.0**	**858.5**	**804.6**	**53.9**

1994/95 ($000s)

EAGLE	Original Allocations	Allocations After Transfers	Expenditures	Variance
Salary	227.0			
HQ		137.6	135.4	2.2
O&M	417.0			
HQ		183.9	184.1	(0.2)
Contributions	422.0			
HQ		801.0	800.5	0.5
Capital	50.0			
HQ		10.0	3.5	6.5
Total	1,116.0			
HQ		1,132.5	1,123.5	9.0
Grand Total	**1,116.0**	**1,132.5**	**1,123.5**	**9.0**

1995/96 ($000s)

EAGLE	Original Allocations	Allocations After Transfers	Expenditures	Variance
Salary	222.0			
HQ		170.0	97.9*	72.1
O&M	698.0			
HQ		230.0	229.9	0.5
Contributions	400.0			
HQ		900.0	900.0	0.0
Capital	---			
HQ		23.9	23.2	0.7
Total	1,320.0			
HQ		1,324.3	1,251.0	73.3
Grand Total	**1,320.0**	**1,324.3**	**1,251.0**	**73.3**

*Salary - HQ (received credit of $23K from Information Management Services Directorate for A. Emond (O.H.U) to provide Enterprise Network LAN Support. In addition, the salary for Mr. Gill (O.H.U) of $46.3K should have been charged to EAGLE but was charged to NAP.

The table below summarizes the AFN budget and staff:

AFN Budget and Staff

($)	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97
Salaries & Benefits	43,220	221,858	283,990	323,409	371,690	411,690	312,000
Administration	5,220	42,795	104,295	43,000	134,300	134,300	175,000
Program Costs	57,313	193,347	182,277	134,591	294,500	354,500	313,000
Total	106,304	460,000	570,562	551,000	800,490	900,490	800,000

Source: EAGLE Annual Report, 1995-96.

Clients/Stakeholders

An estimated population of 100,000 in 63 native communities in the Great Lakes Basin is this initiatives target clientele.

Accomplishments/Outputs

The major accomplishments of this initiative are as follows:

- Partnerships with Aboriginal Canadians have been developed to facilitate community action on health, environment and sustainable development issues in the course of the EAGLE Project. EAGLE represents a full partnership between AFN and Health Canada's MSB. The AFN has been involved in all the stages of implementation of the EAGLE project.

  There are four regional representatives who divide up the basin geographically among them. The representatives are FN employees of the project who travel to individual First Nation communities. They initiate and maintain contact with the communities. They consult each community and identify trainees for the survey work to be undertaken.

  The concept of community empowerment was integrated into the overall design of the EAGLE project. First Nations communities have been involved in all aspects related to the following:

  - what is going to be investigated;
  - how the information is going to be collected;
  - who this information belongs to; and,
  - how this information will be disseminated within the communities.

  "First nation cultures have been based on the concept of sustainability for thousands of years. The EAGLE project is helping communities to re-awaken their traditions and to develop the tools and strategies necessary to make sustainability a reality". Henry Lickers, Principal Investigator, quoted in 1995/96 Annual Report.

- All communities are involved in the project as a whole, and as of May 1996, 44 of the 63 communities in the study area actively participated in the research conducted under EAGLE.

  In the EAGLE Eating Pattern Survey 33 of 63 communities in the study area actively participated in the survey. The number of individual respondents was 1,653. The voluntary community participation rate was over 52%, it was 57% with the inclusion of the pilot survey.

  The EAGLE project is intended to reflect not only scientific principles and government policy, but also must be useful and relevant to individual First Nation communities. Participation in the EAGLE project has been voluntary, and the extent to which the project contributes to community needs and objective is reviewed on an on-going basis.

- In the 1995-96, EAGLE has also collaborated with more than 40 Canadian and U.S. organizations working on health and environmental issues. There has been communication/consultation with other Departments, including Environment Canada, Department of Fisheries and Oceans, Department of Indian Affairs and Northern Development, Ontario Ministry of the Environment, Ontario Ministry of Natural Resources, First Nation organizations across Canada, the International Joint Commission and U.S. agencies.
- Capacities have been strengthened via the delivery of training and education, building awareness, and developing community-based strategies and tools.
- "EAGLE has contributed to a significant increase in understanding, throughout the Great Lakes Basin, about how environmental contaminants affect First Nations health and well-being". From: 1995/96 Annual Report.
- Production of previously unknown or unreliable data such as demographics, mortality/morbidity, harvesting and eating patterns, contaminant levels in fish in areas where OMOEE does not have data, and contaminant levels in other country foods.
- Availability of data on contaminant level within community.
- Work on community health indicators.
- Level of interest in participating in project components in new communities.
- The production of new fish consumption guidelines for 33 communities using a GIS system. The project is examining the high rate of consumption of freshwater fish and wildlife, and the resulting high-risk exposure to environmental contaminants among First Nations within the Great Lakes Basin. The project has produced specific guidelines for the consumption of fish within all communities participating in the Eating Patterns Survey and for which data is available on the level of contaminants in fish in the affected area.

The nature of scientific research that was conducted is as follows:

- survey work related to eating patterns and health.
- a collection of samples and analysis of contaminant levels in fish.

- a collection and analysis of biological specimens from participants in communities.
- Socio-cultural research on the identification of "wellness" indicators as defined by FNs.
- research on the development of education, information and communication tools.

The results show that studies on the effects of contaminants on Aboriginal health in the Great Lakes Basin have not been able to relate contaminants with effects on physical health. Nevertheless, there is concern that the human health effects of contaminants in the Great Lakes Basin could be more widespread and more serious than indicated by the human studies conducted so far.[3]

The EAGLE project has adopted a holistic approach to aboriginal health in the Great Lakes Basin which includes the consideration of "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" as defined by the World Health Organization. "Indirect" health effects of environmental contaminants considered under the EAGLE program include: change of diet; change of life style, social/cultural disruption, and at a tertiary level: diabetes, obesity/loss of fitness; violence (community/familial); alcoholism/drug abuse and suicide.

The EAGLE project has been cited as a model for other areas of Canada. Enquiries are received by the AFN on the EAGLE Project from throughout Canada and the United States as the Project is defining a model that can be used in any project involving community based research. The project was highlighted by DOE at the UNCED Rio Conference.

Information on the risks have been distributed to the communities. Guidelines on the consumption of fish have been developed for all participating communities. Other media will be used, including posters, GIS system and information dissemination sessions organized in the communities. The timing of dissemination varies as a result of various factors. Any abnormal findings identified during the study were to be communicated to the individual and/or their physician in accordance with the EAGLE Principles Document. Information generated by the project is provided to First Nations communities and individuals so that they can understand and act on this information.

Publications include the following:

- A State of Environment and Health Paper was completed for Walpole Island.

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[3] EAGLE Factsheet N#5 pp. 1-2.

- *EAGLE Project Socio-cultural Considerations*, an ethnographic literature review and discussion paper.
- Eating Pattern Surveys '93 and '94.

Initiative 10: Pregnancy and Child Development (PCD)

Objectives/description of initiative

This initiative consists of two sub-initiatives: Native (MSB) and non-Native (LCDC). The goal of the non-Native sub-initiative is to provide a comprehensive program of enhanced disease surveillance and disease control for reproductive health as it relates to the physical and social environment. The objective of the Native sub-initiative is to assess the effects of environmental contaminants on pregnant First Nation mothers and their babies.

Activities

1. LCDC Component

There are 5 major activity areas within this sub-initiative:

- Canadian Child Health Atlas: The goal is to produce the first-ever national summary of the state of the health of Canadian children on a sub-provincial basis. A multi-year project with the Canadian Institute of Child Health , the atlas shows the clear geographic differences in disease, and therefore risk, on a small area (county) basis across the country in terms understandable by the lay person. This project is now completed and the atlas is available.

- National Farm Health Study: This study was initiated to better understand the reproductive health of farm families, as it relates to the general milieu of occupational and lifestyle exposures encountered on farms (with an emphasis on pesticides). A contract with researchers at University of Guelph to conduct the monitoring of pesticides. In addition to the creation of a database, the project produces a Newsletter entitled *Farm Family Health,* in its last year. 7 issues of the Farm Family Health newsletter have been produced.

- Canadian Perinatal Surveillance System (CPSS): This project was enhanced by APHE funding. Other funding involved came from the Tobacco Demand Reduction Strategy. This study is just at the developmental stage and it is hoped that it will continue after APHE. There is a progress report available. To note: After the first two years, the National Birth Outcomes Study was "folded" into the National Perinatal Surveillance System.

- PEI Reproductive Care Study: The goals of this study were to establish a perinatal database in PEI, to undertake environmental risk assessment of perinatal health in the province, and to apply the experience in PEI to the establishment of a national database, the Canadian Perinatal Surveillance System. A multi-year study and fully contracted to PEI Reproductive Care Program in Charlottetown for approximately $800K, this is the last year for research and database development.

- Disease Control Programs - SIDS and NTDs: This study was initiated to continue LCDC's collaboration with intradepartmental and external partners for national prevention programs for Sudden Infant Death Syndrome and Neural Tube Birth Defects. Two small, disease-specific studies were funded by APHE and Brighter Futures. A Joint Statement was issued on SIDS, of which a copy is available, and background papers were prepared in support of a national workshop held in March of 1995 on NTDs.

Financial Summary

LCDC	FY91-92	FY92-93	FY93-94	FY94-95	FY95-96	FY96-97*
Pregnancy Outcomes/Cdn Perinatal Surveillance System	n/a	n/a	n/a	$ 31,000	$296,298	$485,280
PEI - Reproductive Care Program	n/a	$105,000	$120,000	$120,000	$200,000	$224,779
Farm Family Health	$100,00	$155,000	$200,000	$521,000	$415,000	$490,000
NTDs/SIDS	n/a	n/a	$140,000	$ 50,000	$ 41,000	n/a
Child Health Atlas	n/a	$ 42,000	$ 21,000	$ 45,000	$ 60,000	n/a
Transferred to Bureau or DGO for Surveillance Initiatives	$ 5,000	$157,000	$ 24,275	$71,021	$ 86,946	n/a
Total Operating	$105,000	$459,800	$505,275	$838,021	$1,099,244	$1,200,059
Total Salaries	–	$218,000	$360,000	$271,000	$333,937	$467,000
Total Capital	$ 20,000	$ 87,000	$ 60,000	$ 76,000	$ 54,000	$ 60,000
Total APHE Expenditures	**$125,000**	**$764,800**	**$925,275**	**$1,185,021**	**$1,487,181**	**$1,727,059**

* Includes 5% (ADM reserve) Debit

Clients/Stakeholders

Clients and stakeholders include pregnant women in general and farm families in particular, provincial Ministries of Health, the scientific community, Agriculture Canada, industry, and appropriate NGOs (e.g., Canadian Institute of Child Health, Canadian Public Health Association).

2. MSB Component

Partnerships were established with two First Nations on the methylmercury work: The Grassy Narrows First Nation and the Wabaseemoong independent First Nations. The methylmercury database was analysed, investigative work done to locate pregnant mothers who were tested for methylmercury, and preliminary epidemiological assessment of the incidents of stillbirths, spontaneous abortions and congenital malformations in Northern First Nation Communities in Ontario as compared to provincial rates.

This component was under this initiative for one-year (1994-95) only and is continuing under the Northern and Arctic Pollution Initiative (#11).

Financial Summary

1994/95 Budget and Expenditures ($000s)

MSB	Original Allocations	Allocations After Transfers	Expenditures	Variance
Salary	–			
HQ				
Regions				
O&M	103.0			
HQ		50.0	47.3	2.7
Regions		120.0	58.9	61.1
Contributions	263.0			
HQ		179.0	129.8	49.2
Regions		50.0	0.0	50.0
Capital	50.0			
HQ		17.0	14.8	2.2
Regions				
Total	416.0			
HQ		246.0	191.9	54.1
Regions		**170.0**	**58.9**	**111.1**
Grand Total	**416.0**	**416.0**	**250.8**	**165.2**

Clients/Stakeholders

Target clientele are pregnant First Nation mothers and their babies. Stakeholders include the two Northern Ontario communities (Grassy Narrows and Wabaseemoong Independent First Nations) and Health Canada.

Accomplishments/Outcomes

1. LCDC Component

The major accomplishments of this initiative are as follows:

- Canadian Child Health Atlas:

The Canadian Child Health Atlas has been produced and is available at small cost from the Canadian Institute of Child Health. The atlas provides information about children's (under 19 years of age) hospitalization patterns to providers, parents, care givers and policy makers, in a pictorial geographic presentation. Four areas are plotted: respiratory illness; injuries; gastrointestinal illness; and perinatal conditions. The atlas is in reader-friendly format and the maps provide a practical resource to better understand the environment in which children live and play. Examining current patterns of hospital use may help identify how resources can be best used in the years ahead. Highlights identified include the following observations:

- Children living outside Canada's major cities, particularly in the Maritimes (PEI, NB, NS) and western provinces (BC, Alberta and Saskatchewan)) are more likely to be hospitalized than their urban counterparts.
- Infants under 1 year of age are at the highest risk of hospitalization most commonly for respiratory illness.

As well, the atlas reveals disparities between provincial hospitalization patterns. It will be important to develop an understanding of the social, economic and environmental factors that influence these patterns.

- Farm Family Health Study:

All the data was collected in Ontario[4]. Eighty-five (85%) per cent of the dollars for this project was directed at research, while the remaining 15 per cent was communication of the results via the newsletter *Farm Family Health* (7 issues in both official languages have been produced to date). There are two parts to the research; i.e., the Farm Family Health Study and the Pesticide Exposure Assessment Study which is just starting. The 7 Farm Family Health newsletters have been used to convey the results of the data collected and analysed from the 1991-1992 Ontario Farm Family Health Study. The newsletter also conveys the results of other research and scientific studies related to the health and well-being of Canadian farm families.

The newsletters have identified the following health risks to farmers and their families:

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[4] This study was initially intended to be national in scope.

- The accidental death rate on the farm is estimated to be 20% higher than the national average.
- Many farmers and their family members are afflicted with Noise-induced Hearing Loss (NIHL) which is irreversible.
- Farmers are more likely to be exposed to mouldy dust from rotting wet grain which can result in "farmer's lung".
- Hog farmers are particularly vulnerable to the affects of being in confinement buildings where they are exposed to airborne contaminants such as dust, fungi, bacteria and swine dander - chronic exposure can result in diseases such as bronchitis, occupational asthma, organic dust toxic syndrome and allergies.
- Farm men may be exposed more often than farm women to common farm hazards: 89% do heavy lifting, 88% harvest crops, 87% apply fertilizers, 71% work in dusty areas, 69% work with livestock, and 68% apply farm chemicals. Fewer farm women reported doing these tasks.
- Heat stress has been identified as another occupational hazard for farmers.

A new study, the Pesticide Exposure Assessment Study, is just starting and will involve a sample of families who participated in the initial Ontario Farm Family Health Study. The study will investigate whether certain equipment and procedures affect pesticide applicators' exposure to pesticides and how family members may be exposed to pesticides. A progress report will be in the next issue of the newsletter which will be available in the Fall of 1996.

Preliminary results were presented at the First Annual National Canadian Farm Safety Conference. This was the first public presentation of results and the Canadian Coalition for Agricultural Safety and Rural Health (made up of all interested stakeholders and which is the main vehicle for dissemination of information on health and safety issues for Agriculture Canada) was present. As a result, farmers were basically advised to wear protective clothing when spraying pesticides in order to minimize the risk of being exposed to pesticides. In addition, results have also been communicated through scientific papers and some TV interviews (The Farm Show).

- Canadian Perinatal Surveillance System (CPSS):

Still in the development stage, a draft working document in the form of a table produced by the Data Collection Sub-committee, provides a list of the preliminary variables that would require data collection, based on the list of indicators provided to the CPSS Steering Committee members by the Problems, Indicators and Tables Sub-committee at the CPSS Steering Committee meeting in September of 1995. Members of the Steering Committee are currently working to rank and prioritize these indicators and these selections were to be reviewed in May of 1996.

The table also outlines the results of a detailed investigation of possible sources of data on the perinatal variables. Currently, there is no single source or possible linkage of sources that would provide all the variables that are needed to collect the data on the present list of indicators.

A number of related CPSS activities included attendance at a number of conferences, workshops and meetings, including:

- Child Health 2000 (May 30 - June 3, 1995, Vancouver)
- 86th Annual CPHA Conference (June 18-21, 1995, Charlottetown)
- Meeting of the Fetus and Newborn Committee of the Canadian Paediatric Society (June 25, 1995, Montreal)
- 11th Birth Conference - Innovations in Perinatal Care: Assessing Benefits and Risks (October 7-8, 1995, Baltimore, Md.)
- Canadian Perinatal Regionalisation Coalition Meetings and National Conference on Regionalisation of Perinatal Care (November 1-4, 1995, London, Ont.)
- Meeting of the Fetus and Newborn Committee of the CPS and the Maternal Fetal Medicine Committee of the Society of Obstetricians and Gynaecologists of Canada (February 24-26, 1996, Val David, Que.)

- PEI Reproductive Care Study:

The partnership, between the PEI Reproductive Care Program and LCDC under the APHE, provided funding for the development and establishment of the Database. RCP believes that pregnancy outcomes are influenced by events that occur in the pre-pregnancy, pre-delivery and delivery periods and as such, the database contains information on maternal demographic information, prenatal interventions as well as births and perinatal/neonatal morbidity and mortality. Names of patients, physicians or other individuals involved with health care are not recorded in the database. Data from this database will form the basis for further research and possibly assist in changing reproductive care.

To date, 3 years of data has been entered into the computerized Reproductive Care Program (RCP) data base. It is anticipated that 1991 data entry will be completed by the end of June 1996. Currently, data cleaning and conversion is underway and the 1991-94 data should be ready this summer for detailed statistical analysis. The data entered includes gravidas, admits, labours, and babies. Once data entry is complete, risk assessment work can start. The first study planned is a study on Adverse Reproductive Outcomes and Water Quality: A Case Control Study on PEI.

A database report has been published for period of January 1, 1992 to December 31, 1993. The level of inquiry is that of descriptive statistics. No inferences or determination of statistical significance were made.

- Disease Control Programs - SIDS[5] and NTDS[6]:

Sudden Infant Death Syndrome (SIDS):

There are about 400 SIDS deaths in Canada a year which makes it the leading cause of death between one month and one year. A Joint Statement "Reducing the Risk of Sudden Infant Death Syndrome in Canada" by Health Canada, the Canadian Foundation for the Study of Infant Deaths, the Canadian Paediatric Society and the Canadian Institute of Child Health has been published. Based on the knowledge of certain risk factors, these organizations issued the following recommendations for parents:

- "We recommend that normal, healthy infants be placed on their back or side for sleep and that they be cared for in a smoke-free environment."
- "It is important for parents to know that, while infants need warmth and protection from the Canadian elements, they also should not become too hot. Parents can be reassured that, if a room temperature is comfortable for them, it is most likely fine for their infant, too. We advise that infants be dressed and covered in a manner to avoid overheating, even during an illness."
- "We recommend that all women be encouraged and helped to breastfeed their babies."

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[5] Sudden Infant Death Syndrome

[6] Neural Tube Defects

In addition, HPPB has produced a poster "Sweet Dreams", with the above recommendations to support the Joint Statement. The poster is available upon request.

Neural Tube Defects (NTDs):

Health Canada estimates that there are at least 400 NTD births each year in Canada and research has demonstrated that increased intake of folic acid (a B vitamin) by a woman in the periconceptional period reduces the risk of, but does not eliminate an NTD in a fetus. In preparation of the National Workshop held in March 1995, the following 5 background papers were prepared and distributed to workshop participants:

- *Folate Deficiency and Neural Tube Defects: A Synthesis of the Epidemiologic Literature*, Dr. Katherine Gray Donald;
- *A Review of the Genetic Determinants of Neural Tube Defects*, Dr. Alasdair Hunter;
- *The Safety of Folate Supplementation*, Dr. Norman Campbell;
- *Cost-Effectiveness Analysis of Current and Possible Future Public Health Programs for the Primary Prevention of Neural Tube Defects in Canada*, Ms. Cheryl St. Pierre; and,
- *A Compilation of Current Policies and Recommendations in Canada for the Primary Prevention of Neural Tube Defects (NTDs)*, Ms. Chantal Roy.

A National Workshop on the Primary Prevention of Neural Tube Defects was held in Ottawa on March 1-3, 1995 in response to the need to update, clarify and consolidate the various Canadian recommendations on the primary prevention of NTDs. The following recommendations, as reported in the Report of the Workshop, were made:

"Whereas:

- there are potential benefits from a national folic acid fortification program for Canada;
- supplementation programs alone have not proven effective due to difficulties with compliance;
- further evidence of the effectiveness and safety of folic acid fortification of food is required before a national fortification strategy can be implemented;

It is recommended that:

1. Federal/Provincial/Territorial Ministers of Health encourage women who could become pregnant to supplement their diets daily with folic acid to reduce the incidence of NTDs, and support a population based pilot study on folic acid fortification. Its aim would be to examine the effectiveness, practicality and risks of an optimal intake of folate to achieve a significant reduction in the incidence of NTDs.

2. education for health professionals be enhanced in the area of B_{12} (cobalamin) deficiencies.

3. Federal/Provincial/Territorial Governments set a goal to significantly reduce the incidence of NTDs; the necessary surveillance systems (Federal/Provincial/Territorial) be enhanced or created for NTDs and for the adequate monitoring of both positive and negative outcomes resulting from any interventions.

A copy of the full workshop report can be obtained free through the Bureau of Reproductive and Child Health, LCDC, Health Canada. Specific questions regarding the workshop can be addressed by contacting the Spina Bifada Association of Canada in Winnipeg.

2. MSB Component

Health risks to the foetus due to the presence of methylmercury in the environment are being studied. There is no evidence on file that results have been finalized. Work is ongoing under the Northern and Arctic Pollution Initiative.

Partnerships have been developed with the Grassy Narrows First Nation and the Wabaseemoong independent First Nations.

Initiative 11: Northern and Arctic Pollution (NAP)

There are two components within this initiative: Native (MSB) and non-Native (HPB).

MSB Component

Objectives/description

The objective of this component is to blend community and scientific knowledge in a partnership to examine the effects of contaminants on the health and well-being of the Northern First Nations populations.

All studies under this component of the NAP initiative are based on the premise that, because of lifestyle, Aboriginals are frequently more exposed to contaminants in the environment, particularly in fish and wildlife, than is the general population. Therefore, the specific objectives of this component were to:

- identify the aboriginal communities in Northern Canada and their concerns related to the environment;
- review and identify scientific information relevant to native health in the North;
- identify conceptual models and tools for community epidemiology research related to aboriginals and environmental contaminants in Northern Canada;
- obtain the levels of contaminants in "country foods", including fish;
- identify aboriginal eating patterns emphasizing "country foods" and fish;
- measure contaminant levels in human tissues and fluid as appropriate;
- compile relevant existing population-based health information on the First Nation aboriginal populations in Northern Canada;
- study the effects of contaminants on the culture, lifestyle and social/economic well-being of the Northern First Nation communities;
- estimate the contaminant exposure levels within the aboriginal communities;
- explore and investigate risk levels, both quantitative and qualitative;
- explore the feasibility of using biochemical markers;
- investigate the feasibility of comparison techniques for the aboriginal communities;

- ensure that any abnormal health findings are communicated immediately to the individual concerned and/or the individual's physician;
- distribute all reports, results, conclusions and recommendations to participating aboriginal communities, aboriginal and non-aboriginal organizations and government departments; and
- involve the First Nation communities in all aspects of the projects.

Activities

The main activities included:

- Pilot eating patterns surveys conducted in the North to develop the process for more comprehensive eating patterns surveys and provide limited data on "country foods" consumption rates; and, activities carried out in the regions through a number of partnerships with Aboriginal organizations:
    - The B.C. Region is assisting the First Nations in addressing environmental contaminant issues through programs of information, education, problem identification, and project support through the Health and Environment of Aboriginal Life (H.E.A.L.) Project Committee and the B.C. First Nations Summit Health Committee.
    - The Alberta Region is addressing issues identified in the Northern River Basin Study Board's final report.
    - The Saskatchewan Region is participating in a baseline health study in Northern Saskatchewan on uranium mining, identifying environmental health issues with the Prince Albert Grand Council in its member First Nations and developing remediation strategies and monitoring radon in 13 First Nations.
    - The Manitoba Region is working with the Manitoba Keewatinowi Okimakanak Inc. (MKO) to address MKO member First Nations environmental health concerns.
    - Ontario Region is: developing a community-based strategy to deal with environmental contamination in Big Trout Lake; reviewing fuel oil spills in the Sioux Lookout Zone area to determine how they correlate with the general health conditions on First Nations; and, conducting a comparison study of 5 Northern Ontario First Nations communities on PCB contamination in the food chain.

- The Atlantic Region is working with the Labrador Inuit Association to hold workshops on environmental health issues.

In addition, a pilot study, initiated under the Pregnancy and Child Development Initiative, is continuing on under this initiative in two northern Ontario communities, Grassy Narrows and White Dog First Nations. The goal of this study is to assess relationships between mercury exposure and subtle child development indicators. There are three phases: 1) School records review and teacher/parent's evaluation, 2) Behavioural testing and 3) Neuropsychological testing.

Financial Summary

The following tables summarize the APHE budgets and expenditures for the MSB component of Northern and Arctic Pollution initiative for the years FY92/93 to FY95/96.

1992/93 Budget and Expenditures ($000s)

Northern and Arctic Pollution	Original Allocations	Allocations After Transfers	Expenditures	Variance
Salary	141.0			
HQ		141.0	55.0	86.0
Regions				
O&M	387.0			
HQ		137.0	120.9	16.1
Regions				
Contributions	100.0			
HQ		350.0	315.0	35.0*
Regions				
Capital	50.0			
HQ		50.0	50.0	0.0
Regions				
Total	678.0			
HQ		678.0	540.9	137.1
Regions				
Grand Total	**678.0**	**678.0**	**540.9**	**137.1**

* Advised by DG to withhold $26K for the budget cut.

1993/94 Budget and Expenditures ($000s)

Northern and Arctic Pollution	Original Allocations	Allocations After Transfers	Expenditures	Variance
Salary	141.0			
HQ		135.8	143.6	(7.8)
Regions				
O&M	96.0			
HQ		73.8	42.3	31.5
Regions		57.9	14.7	43.2
Contributions	300.0			
HQ		292.3	235.5	56.8
Regions		92.1	102.3	(10.2)
Capital	50.0			
HQ		5.0	4.2	0.8
Regions		—	—	–
Total	587.0			
HQ		506.9	425.6	81.3
Regions		**150.0**	**117.0**	**33.0**
Grand Total	**587.0**	**656.9**	**542.6**	**114.3**

1994/95 Budget and Expenditures ($000s)

Northern and Arctic Pollution	Original Allocations	Allocations After Transfers	Expenditures	Variance
Salary	237.0			
HQ		119.0	124.7	(5.7)
Regions				
O&M	495.0			
HQ		129.6	85.7	43.9
Regions		252.0	193.5	58.5
Contributions	316.0			
HQ		350.0	233.0	117.0
Regions		261.0	228.0	33.0
Capital	50.0			
HQ		10.0	13.0	(3.0)
Regions				
Total	1,098.0			
HQ		608.6	456.4	152.2
Regions		**513.0**	**421.5**	**91.5**
Grand Total	**1,098.0**	**1,121.6**	**877.9**	**243.7**

1995/96 Budget and Expenditures ($000s)

Northern and Arctic Pollution	Original Allocations	Allocations After Transfers	Expenditures	Variance
Salary	231.0			
HQ		108.0	147.7	(39.7)*
Regions				
O&M	789.0			
HQ		139.3	139.0	0.3
Regions		99.8	36.8	63.0
Contributions	300.0			
HQ		177.9	177.9	0.0
Regions		815.0	629.6	185.4
Capital	--			
HQ		2.8	2.8	0.0
Regions				
Total	1,320.0			
HQ		428.0	467.4	(39.4)*
Regions		**914.8**	**666.4**	**248.4**
Grand Total	**1,320.0**	**1,342.8**	**1,133.8**	**209.0**

*Salary - HQ (received credit of $23K from Information Management Services Directorate for A. Emond (O.H.U) to provide Enterprise Network LAN Support. In addition, the salary for Mr. Gill (O.H.U) of $46.3K should have been charged to EAGLE but was charged to NAP.

Clients/Stakeholders

The clients and stakeholders of this component include Northern Aboriginal residents, MSB, DIAND and the scientific community.

Accomplishments/Outcomes

Methylmercury Program Initiated Under PCD

Three papers have been produced and published in refereed scientific journals. These include:

- *Balancing Human Exposure, Risk and Reality: Questions Raised by the Canadian Aboriginal Methylmercury Program*, B. Wheatley, S. Paradis, NeuroToxicology, 17 (1): 241-250, 1996 - discusses the management of risk from exposure to methylmercury in the Canadian Aboriginal population, focussing on the need to balance theory and the real impact on health caused by restrictive advice on consumption of traditional foods, especially fish.
- *Exposure of Canadian Aboriginal Peoples to Methylmercury*, B. Wheatley, S. Paradis, Water, Air and Soil Pollution, 80: 3-11, 1995 - presents the initial results of the 20-year retrospective analysis including seasonal exposure patterns and trends in exposure levels - highest levels of methylmercury found in the two communities of Grassy Narrows and Whitedog - further analysis indicated and set the basis for the this pilot study.
- *Exposure of Canadian Aboriginal Peoples to Methylmercury*, B. Wheatley, Environmental Sciences, 3, 1(1994), pp 33-40.

Regional project results are as follows:

Atlantic:

Results of the workshop (part of the larger Eco-Research project) held in 1995 in Nain, Labrador by the Labrador Inuit Association identified:

- specific concerns: air pollution from mining dust, etc. which may lead to asthma attacks or general lung problems; incidence of cancer at Hopedale, Nain, Postville and Makkovik; and, the necessity that certain foods (pork, Black bear) be thoroughly cooked to avoid illness;
- the importance of developing an approach to communicate concerns about perceptions of risk in a cross-cultural situation; and
- concerns of the north coast communities regarding development (Voisey Bay, low level military flights), sewage and water and waste management.

In addition, the workshop resulted in recommendations on how best to involve the coastal communities in an environmental study.

Ontario:

The study of fuel spills in the Sioux Lookout Zone involved the Sioux Lookout First Nations Aboriginal Health Authority which developed an education strategy for the community to improve community handling and storage of fuel oil and increase knowledge of appropriate response of fuel spills.

Manitoba:

MKO's Environmental Health Initiative identified and documented the range of environmental health issues facing the 26 MKO First Nations. The issues of most significance included housing, water quality, sewage disposal, garbage disposal and fuel contamination. The resulting report contains individual reports from each of the 10 MKO First Nations consulted. Recommendations of the report focused on strengthening and developing capacity of MKO First Nations to respond effectively to the environmental health concerns of their residents.

Alberta:

The Northern River Basin Study funded 10 affected First Nation communities to meet and discuss Traditional Knowledge findings (also included salary of project manager), a Human Health Monitoring Program using aboriginal communications (audio reports in Cree and Chipewyan languages on radio), a First Nation review of Northern River Basin Study Synthesis Reported and First Nation recommendations, and the High Level Tribal Council Environmental Health Study project design (with assistance by the University of Ottawa). The design phase of the latter project is completed.

Pacific:

There were fifteen projects in First Nations communities supported by the H.E.A.L. Project Committee. Project activities included diet surveys, contaminant studies on traditional foods (e.g., loss of traditional sources of food), community meetings on how to deal with contaminants in traditional foods, as well as a fish quality study and the design of a valid and reliable food use dietary survey instrument. Although most studies are in the analysis stage some results are available:

- The Westbank First Nation produced a video on the use of traditional foods and plants in the area and the impact of environmental contaminants. Areas of concern included: agricultural herbicide and pesticide use, loss of degradation of habitat, urban development, exotic species, sewage and septic tans and contaminated sites.
- The Diet Survey and Nutrition Workshop (held by the Mowachaht/ Muchalaht Band) provided a venue for presenting the survey results as well as providing nutrition education to the CHR's of the 21 communities of the Tribal Council.

- The results of the Carrier Sekani Tribal Council's Fish Quality Study showed the salmon had soft flesh and cancerous growths and a second phase will be proposed.
- Some training of Natives has occurred, such as sample collection, etc..

To date, no health risks as such have been identified. Potential sources of health risks have, however, been identified such as methylmercury levels, garbage disposal, water quality, housing, fuel oil spills, mining waste, etc., by the activities of the Initiative. There is evidence on file that information on studies has been distributed in a variety of ways:

- workshops
- 7 scientific papers
- community meetings
- radio broadcasts in native languages

There is no evidence on file to indicate that information obtained has been used to manage health risks.

There is a large amount of evidence available in the documents to indicate that partnerships with Aboriginal Canadians were developed as a major component in the implementation of the activities under this Initiative.

HPB Component

Objectives/Description

The goal of this component is to assess the health risks and the specific concerns of northern communities. It involved a series of scientific studies and the goals/objectives of this component are linked to the individual studies.

Activities

The activities carried out under this component were linked to the Arctic Environmental Strategy (DIAND's Green Plan initiative). As DIAND only works North of 60, some AES activity in Northern Quebec and Labrador was funded through APHE. The activities are summarized below:

Labrador Collaborative Study: The objective of this study was to measure lead, mercury and organochlorine contaminants in cord blood of infants born in Nunavik. Data is to be used to link exposure to community and dietary exposure of the mother. Further, levels of exposure were to be linked to any health outcomes using variables such as health status at birth, thyroid function, and vitamin A plasma level. Data will be compared with other data from the south and from the NWT and used to prepare risk assessments relating to prenatal exposure.

Dietary Intake Studies in Northern Communities - Mackenzie Phase I (93/94) and Mackenzie Phase II (94/95): Also known as the Yellowknife/Back Bay Dietary Study, this study was conducted under contract with the Government of the Northwest Territories (GNWT) by the Mackenzie Regional Health Service to gather dietary information over one year (in two seasons) by surveying the two Dene First Nation communities, Dettah and Ndilo and analyse the gathered information. The consumption data is expected to provide information for use in Health Canada's health hazard process.

Yukon First Nations Assessment of Dietary Benefit and Risk: Caribou organ meat and various species of fish have been shown to contain potentially significant amounts of contaminants, but accurate health hazard assessment has been limited by the gaps in knowledge of present levels of consumption. The main activity involves the collection of dietary information and country food samples in four Yukon First Nations communities. This is an ongoing multi-year project with many funders: HPB's Chemical Health Hazards Division, MSB and AES. Partners included: CINE (Centre for Nutrition and the Environment of Indigenous Peoples at McGill), the Council of Yukon Indians, the Yukon Contaminants Committee, Yukon Territorial Government, Environment Canada and Health Canada. The consumption data is expected to provide valuable information for use in HPB's health hazard assessments.

Toxaphene Primate Study: Toxaphene was a widely used pesticide in the U.S. and has been found to be the organochlorine contaminant of highest concentration in marine food sources in the Arctic. This is believed to be due to long range atmospheric transport. A study of toxaphene using cynomolgus monkeys was to be initiated under APHE. This is an oral dosing study with 3 levels of toxaphene and a control. Clinical, biochemical, immunological and reproductive endpoints will be monitored.

Human Contaminant Trends in the NWT: The purpose of this study was to expand human health monitoring in the NWT through the collection of dietary information as part of the ongoing maternal and cord blood sampling project and where feasible, collect human milk from the same participating mothers.

Toxicity Profiles: The aim of this activity was to: generate complete toxicological reviews (toxicity profiles) for priority environmental contaminants identified in traditional country foods; to support the maintenance of these profiles in a computerized database accessible to internal government and external health researchers and agencies; and to develop/redefine human contaminant guideline values through the participation of committees/working groups.

Human Milk, Cord Blood and Biomarker Assessment: This study involves the collection of human milk, cord blood and maternal blood from donors in the NWT. Samples were to be analysed for PCB, organochlorine pesticides, PCDD and PCDF. Cord blood and maternal blood was to be collected from a subset of donors as well as from donors in the south. The blood will be assessed for various immune system parameters. Comparisons will be made between the North and the South (controls).

Immunotoxicity Studies: These studies are being carried out to ensure that a set of immunotoxicological methods are standardized and applicable to human specimens; i.e., peripheral whole blood and serum.

Northern Food Chain Contaminants Database: $10K of APHE funding (1993/94 only) went to provide continued service support, to update the computer disk to reflect additional research, and to collaborate any refinements required by Health Canada. This database makes accessible a mass of information related to pre-1994 contaminants analyses.

Financial Summary

Fiscal Year: 1993/94

Study	Allocated	Spent	Unspent
Human Milk/Cord Blood and Biomarker	$18,000	$15,227	$2,773
Labrador Collaborative Study	$176,000	$104,146	$71,854
Dietary Intake	$215,600	$116,832	$98,768
Toxicology Profiles	$8,000	$8,104	($104)
Director's Office	$12,000	$8,050	$3,950
Scientific Services	$9,000	$171,772	($162,772)
Total	**$438,600**	**$424,778**	**$14,469**

Fiscal Year: 1994/95

Study	Allocated	Spent	Unspent
Human Milk/Cord Blood and Biomarker	$55,000	$55,000	–
Labrador Collaborative Study	$10,000	$10,000	–
Human Milk/Cord Blood	$160,500	$58,007	$102,493
Dietary Intake	$150,500	$65,000	$85,500
Toxicology Profiles	$53,500	$33,678	$19,822
Director's Office	$99,800	$28,621	$71,179
Total	**$529,300**	**$241,306**	**$278,994**

Fiscal Year: 1995/96

Study	Allocated	Spent	Unspent
Human Milk/Cord Blood and Biomarker	$260,999	$225,437	$35,562
Labrador Collaborative Study	$227,778	$227,778	–
Human Milk/Cord Blood	$142,730	$132,847	$9,883
Toxaphene Primate Study	$343,100	$343,006	$94
Dietary Intake	$69,499	$68,546	$953
Toxicology Profiles	$6,000	$5,781	$219
Director's Office	$5,091	$615	$4,476
Total	**$1,055,197**	**$1,004,010**	**$51,187**

Fiscal Year: 1996/97

Study	Allocated
Human Milk/Cord Blood and Biomarker	$33,257
Toxaphene Primate Study	$188,800
Traditional Foods	$48,667
Immunotoxicity	$57,285
Director's Office	$21,570
Total	**$349,579**

Clients and Stakeholders

Targeted clientele of this initiative are the provincial and territorial governments and the regional health boards. The principal beneficiaries and stakeholders are the residents of northern and native communities, DIAND, Health Canada and the scientific community.

Accomplishments/Outcomes

The results to date of the studies undertaken under this component are as follows:

- **Health Hazard Assessments:** There have been 33 assessments completed, all of which have benefitted from the data and/or toxicity profiles generated by the following APHE projects.
- **Toxaphene Primate Study:** The pilot study was completed in cynomolgus monkeys and dosing details, analytical methods, tissue sampling and other problems have been addressed. Clinical, haematological, reproductive and immunological testing has begun.
- **Human Milk, Cord Blood and Biomarker Assessment:** A contract was let to the GNWT to conduct a feasibility study for the monitoring of human milk from residents of the NWT. An analysis of 67 samples of human tissue from 41 Inuit residing in Greenland showed high exposure levels based on TCDD toxic equivalents to be from 5 to 10 times higher than people living in more southern latitudes. Data will be compared with enzymatic biomarker parameters being carried out on liver samples (collaboration with Public Health, Quebec). Consultation, training and preparation of recruitment packages and general educational materials necessary for human milk sampling in Inuit communities has been completed.

- Yukon First Nations Assessment of Dietary Benefit and Risk: The data has been collected and the analyses are underway.

- **Dietary Intake Studies in Northern Communities - Mackenzie Phase II:** This project has been completed as planned. Ninety-four (94) interviews were completed which yielded 206 completed questionnaires. Lab analyses of one full year of fish and caribou sampling have been completed and the analysis of the spring and summer interviews is underway with the round of fall and winter interviews set to begin. The associated health hazard assessment of the Yellowknife/Back Bay fish contaminants data was also completed in August of 1996. It advised the GNWT Technical Committee on Arctic Contaminants (TCAC) that the levels of contaminants in fish from these waters did not pose a health hazard.

- **Toxicity Profiles:** This project initiated toxicological reviews for endrin, endosulfan, methoxychlor and tris (4-chlorophenyl) methane. Completed profiles include toxaphene, mirex, photomirex, dichlorobenzene and penta-chlorobenzene. Regulatory values (i.e., provisional tolerable daily intakes) were developed for photomirex and dichlorobenzene, revised for mirex and pentachlorobenzene, and reassessed for toxaphene. A regulatory review was conducted for chlordanes. HPB also continued its participation in the development of working guidelines for human blood contaminant guidelines used by the GNWT Cooperative Risk Management Group.

- **Human Contaminant Trends in the NWT:** A virus outbreak in early 1996 reduced the study's scope and the work could not be completed as initially planned. Methodology instruments have been completed. The 1996 milk samples currently being collected by the Keewatin Regional Health Board will be sent to HPB for contaminant analysis.

Initiative 12: Healthy Environment Program (HEP)

Objectives/description of initiative

The Healthy Environment Program emphasizes and establishes the basic ideas of health promotion as the foundation for helping Canadians to adopt behaviours that improve environmental conditions for better health. The objectives of HEP were to:

- increase awareness of environmental health issues;
- promote the involvement of individual Canadians in a healthy environment;
- make it easier for Canadians to understand their own capacity to influence their health and the environment in which they live; and
- increase and strengthen partnerships and collaborative efforts with others who share their goals.

Activities

There are three main activity areas:

1. Grants and Contributions

   There were a total of 27 projects funded through grants or contributions, each with their own goals and objectives. Projects explored both the broader issues of healthy communities/environmental citizenship and the more specific issues surrounding health and the environment such as UV radiation and air quality. (Responsibility for the Grants and Contributions is now with the Healthy Living and Environments Division.)

2. Community Animation Program (CAP)

   The Community Animation Program is a national partnership between Health Canada and Environment Canada that supports communities working on health and environmental issues. The way CAP is managed varies from region to region.

   There were two parts to CAP:

   CAP I was a six-month pilot project for the current CAP (or CAP II) initiated in the fall of 1993 and running until the spring of 1994. It was conceived and funded by Health Canada. The key goals of this pilot project were to bring together community health and environment leaders to identify healthy environment issues and to work with these leaders to identify solutions; and, to study and test ways of how community change can be initiated, accelerated and supported. Four pilot regions were selected for CAP I: British Columbia, Saskatchewan, Quebec and Nova Scotia.

In December of 1994, **CAP II** was launched and was designed to run until March 31st 1997. CAP II was intended to contribute to sustainable community development in Canada. Its two objectives are: to increase the capacity of communities to take action on issues related to health and the environment; and to enable communities to access available expertise/knowledge existing in federal departments, provincial and municipal governments, associations and NGOs.

The implementation of CAP II is directed at the regional level in six regions: British Columbia/Yukon; Alberta/Northwest Territories; Saskatchewan/Manitoba; Ontario; Quebec; and the Atlantic Provinces.

Financial Summary

Program as a Whole

Year	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97
Original Cabinet Totals	585	3665	4400	4600	4650	4800
Salary	0	66	120	150	150	150
CEPB	0	11	19	24	24	24
O&M	585	1678	1341	2056	1644	1262
Capital		10	10	10	10	10
G&C		1050	1700	1797	845	238
Total	**585**	**2815**	**3190**	**4037**	**2673**	**1684**

Community Animation Program

The overall CAP budget is $2,400,000 over two years. Seventy percent of the CAP funds come from Health Canada, and the remaining thirty percent come from Environment Canada. The regional budgets range from $300,000 to $400,00 per region for the two-year period covering FY 1995-96 and FY 1996-97 which translates into $150,000 to $200,000 per region per year.

Social Marketing

The total budget for this activity area from 1991 to 1996 is $2,119,000.

Clients and Stakeholders

The Healthy Environment Program's target clientele are community groups, other levels of government, NGOs, and Canadian communities working on healthy environment issues.

Accomplishments/Outcomes

As a result of the activities undertaken by HEP, the following has occurred:

- **Grants and Contributions Projects:** As a result of these projects, a number of tools have been produced to help create awareness and to promote involvement of individual Canadians in a healthy environment. These included workshops, guide books, surveys, videos, ad campaigns and the development of a software program.

- **Community Animation Program:**

  CAP I:

  In British Columbia, the CAP pilot made start up money and strategic resources available to communities that wanted to deal with health and environment issues. Several projects were supported, including support for the planning of a conference for the Dawson Creek C.A.R.E. Project, and funds for travel costs and accommodations for staff of a camp for disabled teens and young adults while they were involved in program development and site assessment studies in an environmental community.

  In Saskatchewan, the Saskatchewan Environmental Society invited 28 environmental organizations to consider how CAP could assist the work they did. A total of 23 projects were funded by CAP I, including: an awareness and educational campaign targeted for Saskatonians concerning personal and public benefits of choosing alternative transportation; an educational program about native prairie species through an indoor workshop, a field trip and lab sessions; a community education project on backyard composting; and the development of an educational program on uranium mining and nuclear development and their negative impacts on the environment and health.

  In Quebec, the UQCN sought to: increase the awareness in four communities on the link between health and the environment; help create linkages between representatives involved in the health and environment sectors in each of the pilot communities; foster a discussion in each community to identify the needs with respect to health and the environment; and, identify priorities for action which could take place in each of the communities.

In Nova Scotia, the Clean Nova Scotia Foundation developed the Restoring Environmental and Community Health (REACH) which aimed at supporting communities to take action on issues relating to health and the environment. Nine community groups were supported.

CAP II:

Environment Canada is now contributing 50% to CAP. This is seen to be a significant accomplishment for the program.

CAP II is really just getting underway and it is too early to assess the accomplishments. However, a number of strong partnerships, in particular the one between Health Canada and Environment Canada, have been already developed. A number of activities are underway in the six regions including:

Atlantic Canada: To date there are approximately 50 communities working with CAP Atlantic from all four provinces. The processes range from developing community gardens, to surveying the biota of post-mining watershed areas, to developing an environmental committee within a Community Health Centre, to youth concerns over their health and the health of their communities, to training and skills development, to working with seniors on safe disposal of unused drugs, etc.

In addition, there is a Resource Centre which provides community groups and citizens with access to research material.

Quebec: Currently, CAP is supporting activities in six low-income communities in three different geographic areas: rural, semi urban and urban. Most of these communities are members of the Regroupment régional des villes et villages en santé. The Regroupment will disseminate lessons learned through its own network which reaches more than 90 communities in the province. Experienced individuals are identified by the communities as local animators.

Ontario: There are currently CAP projects underway in ten communities; for example:

- promotion of responsible septic maintenance, conservation of water resources and educating rural residents on the links between the use of their septic system and well water, as well as broader ecosystem impacts (West Garafraxa Township);

- promotion of food security initiatives such as food cooperatives, nutrition, organic growing, low transportation food distribution networks, etc. (Peterborough); and,

- training ambassadors to engage in outreach activities within the Toronto Chinese community.

Manitoba/Saskatchewan: CAP II is well underway in both Manitoba and Saskatchewan at this time. The Manitoba and Saskatchewan CAP II contracts focus on linking various key players and stakeholders, from various disciplines, in order to facilitate action that grows out of health determinants interaction.

In Manitoba there are two initiatives underway: one focusing on groundwater quality issues and the other focusing on the identification of aboriginal key players and stakeholders in health/environment issues and linking them with non-aboriginal communities/groups/individuals in Manitoba that are already working in the healthy environment area. The key in both these initiatives is the goal of linking key players and stakeholders who don't usually work together; e.g., First Nations/Non-First Nations; economic development groups/environment groups; health organizations/grass-roots community movements; etc.

In Saskatchewan there is currently one contract which will see three community animators working with various sectors within Saskatchewan to develop partnerships, explore various definitions of healthy communities and promote the concept of holistic health. The animators will not only utilize Saskatchewan's 30 Regional Health Boards as an initial access point to various community stakeholders, but will also work with environmental groups, health organizations and economic development groups.

Alberta and the Northwest Territories: Alberta has eleven initiatives in progress covering a wide variety of issues, including: recycling, air and water quality, education and training programs, creating networks, preparing booklets and establishing a library. There have been a number of "success stories" documented in the province of Alberta. Three of these are summarized below. All three received assistance from CAP.

- **Alberta Environmental Network (AEN)**: The AEN is providing a life-line for its members and anyone else interested in environment and health. Train the Trainer workshops have been held in Lethbridge, Calgary, Edmonton, Grande Prairie and Red Deer. Now these trainers, locally and in neighbouring communities, are helping others "surf the net", teaching them how to access information and use the technology successfully in their work. "The AEN is made up of about 200 individuals and groups scattered throughout the province actively involved in environmental and health issues. Their mandate is to share ideas and concerns, do research, pool resources, strategize and develop positions, and support each other" explains With the network's limited resources for travel to meetings, the Internet has become a prime opportunity to keep the communication flowing.

- The **Oliver Community League and Caritas Health Group** completed a study to determine what skills and abilities businesses, associations and individuals have to support community health in the downtown neighbourhood. As a result of this study, it became evident that there was tremendous capacity in Oliver, but limited knowledge among community members about where it could be found. Therefore, the group is in the process of producing a resource booklet for distribution to the 500 businesses and associations, as well as to the residents of the community.

- Two **Holistic Resource Management training workshops**, coordinated by the Mannawanis Friendship Centre in St. Paul were held. Holistic Resource Management is a seven-step process of goal-setting and decision-making, an inclusive and practical way for a community to manage its land, human and financial resources. The training includes identifying community resources and issues, building links and partnerships, determining and evaluating community goals and the decisions it takes to achieve those goals. More than 40 individuals ,representing a cross-section of the St. Paul community and surrounding area, attended the workshops.

British Columbia/Yukon: This region also has 9 initiatives underway. The primary focus is creating networks, conducting conferences, and education. Results to date include:

- **CAP Spring Forum - March 29-30, 1996**: A two-day gathering of community leaders involved in health and the environment was organized from all areas of British Columbia. This enabled Health Canada to identify similarities and differences among communities. The main outcome of this two-day conference was the greater understanding of the ability to work together in partnerships, collaboration and support.

- **Mentoring Group For Action:** An unexpected result of the two day Forum was the inauguration of a total participant mentoring group. Participants will act as a conduit and link to the Community Animation Program to established networks, community groups and organizations.

- **New Technique for Working Among Communities - Bio-Regional Mapping**: A Bio-regional mapping process, which describes communities from a bio-physical and socio-cultural attributes perspective, has been created. This unique mapping process provides CAP with one of the first tools aimed at clearly defining legitimate borders and boundaries of regions within the province of British Columbia that are not based on strictly geographical nor demographic information.

- **Open-space Learning Creates Open Learning:** Part of the Spring Forum was the introduction of a method community leaders could use to involve a broad section of their community in identifying issues and concerns. Open-space is a public participation technique utilized to allow groups to determine what is priority and what is not. CAP will be promoting this technique through the CAP mentoring group to ensure its use as a new and exciting training opportunity.

- **Electronic Networking:** In addressing the CAP recommendation that communities be provided with networking and communication support through an electronic network (Internet), CAP has undertaken to establish partnerships with Vancouver Community Net (FreeNet) and the Sustainability Council - Whistler Centre for the Business and the Arts to create and sustain an electronic network.

- **Community Initiative:** CAP has formed a relationship with the Coastal Communities Network to assist in their work sustaining fishing communities in over 60 British Columbia locations. CAP has offered resources in training, communication and networking that the Network has accepted and will utilize.

- **RECAP - Communicating with Mentors**: CAP produces a monthly bulletin called "RECAP" which provides monthly updates to the 95 mentors and advisors as to CAP activities and updates. RECAP sends information to community members which allows them to review CAP activities and comment on each of the initiatives.

- **Social Marketing:** A small sample of activities to date include the following:
  - dissemination of Healthy Environment messages through the CBC programs "ALIVE" and Street Cents;
  - input on health/environment messages specific to UV radiation and indoor air quality for the Earth Day Special held on April 22, 1995;
  - input to the french television show "Salut Bonjour" - a regular half-hour program on Radio-Canada that tries to inform viewers of recent prevention or treatment methods to combat health programs;
  - preparation of the "Teacher's Guide", an extension of the Street Cents video, which is targeted to students in grades 7-11;
  - production of "The Healthy Environment Program", a series of 60-second vignettes on health and the environment to be aired on the hour on the Weather Network and its French affiliate Meteomedia. A winter series and summer series were implemented;
  - an Envirodollars Project (conducted in July and August of 1996). Passengers using the London, Ontario transit system were to receive Envirodollars (discounts at participating retailers) if they bought passes for July in June; and
  - translation into French of the Green Games Guide, which outlines how to incorporate environmental considerations into the planning of any sporting event.

Workshops and promotional events for each of the activity areas are as follows:

- Grants and Contributions

  Projects which received funding in excess of $50,000 were primarily in the form of workshops/conferences/seminars/expositions/symposiums where participants, mostly health professionals, used the opportunity to share success stories. The information that was gathered at these events was intended to be relayed to other individuals involved in health care and the environment and through them to the general public, educators and students. Furthermore, these events promoted capacity building within communities, groups and individuals.

  Other promotional events included the production of books/manuals, conducting an ad campaign, conducting surveys, producing a video and designing an interactive computer software program. Each of these initiatives were also designed to provide information to the general public and students.

- CAP II

  In terms of workshops, educational and promotional events, CAP II is designed to create increased awareness and knowledge of the links between human health and the environment by creating networks among communities involved in CAP. The networks will be sustainable, will share information, lessons and success stories, and will develop new partnerships between communities, NGOs, and other levels of government. Members of the community will have an increased ability to identify, address and promote issues central to the group.

- Social Marketing

  HEP is making use of television and special events (e.g., Earth Day) as a means of conveying particular messages to Canadians.

A number of partnerships were formed under the Initiative to increase community and individual action on health, environment and sustainable development issues.

- Grants and Contributions

  Seven of the workshop initiatives were specifically designed to encourage the participants to establish networks while attending a particular conference. In addition, the issues discussed at the workshop were to be relayed to other interested groups through existing networks to keep interested parties apprised of important issues regarding health and the environment. Longer term partnerships were developed to deliver key messages to the public, i.e., CANDO and Healthy Living with Sunshine Programs.

- Community Animation Program

  As noted previously, creating partnerships and networking is the main thrust of the initiatives undertaken in all provinces and territories.

- Social Marketing

  A partnership developed with the Weather NetWork to produce 60-second vignettes on health and the environment on the hour, and a partnership was also created with the London transit system, through the Envirodollars project.

The extent to which communities participated in the initiative is as follows:

- Grants and Contributions

  There were numerous communities (documented in the files) which participated in the activities of the initiative. Unfortunately, not all of the files contained actual numbers, therefore it is impossible to provide an accurate figure. All communities, save one, were able to meet their objectives under the Initiative. The Inuit Tapirisat of Canada (ITC) were unable to take action on their plan to manage waste in the North, because the external review process undertaken by HEP resulted in an ambiguous conclusion and there was resistance to the ITC Initiative. Subsequently advised by HPPB: "The ITC project accomplished its goals of bringing representatives together to discuss and advance action on environmental health issues in Inuit communities". One spin off of this project was a subsequent funding for a specific project on waste management issues in the north. This subsequent project was supported by HEP and produced excellent information on the community integrated waste management needs in the Arctic.

  The actions taken to address health, environment and sustainable development were varied, and dependent upon the final product. As noted earlier, funding was provided primarily to conduct workshops which were designed to establish new networks, and also to use existing networks to relay information learned while attending the conference. All final reports indicated the workshops were successful.

  The following products were developed as tools to be used as a means to improve knowledge, solicit action and develop healthy environments: books and video were produced, ad campaigns were conducted and a computer software program was created.

- Community Animation Program

  Community participation is strong all across the country. Each province and territory has formed committees to examine the issues that are of the greatest concern to a particular community within the region. In addition a great deal of effort has been put forth to establish networks and partnerships between various groups both on a provincial and national basis. The purpose of these committees and networks is to ensure information is shared, and the general public is educated about the interrelationship between health and the environment.

- Social Marketing

Community participation is examined in terms of target audiences. The General Public is required to become involved and aware. Community based initiatives will be encouraged to promote the idea that individuals can have an impact on the environment and their potential health status. Youth will have special initiatives focusing on them as a group, because they provide the greatest long-term potential for change. The cooperation of stakeholders, (health professionals, environment groups, Healthy Communities networks, and educational authorities), all need to be enlisted as agents of change. Business and industry are expected to provide financial contributions and to show leadership in promoting concern for health and the environment.

Initiative 13: Risk Communication

Objectives/description of initiative

The goal of this initiative was to design and implement a program to ensure that factual, balanced, science-based information concerning health risks in the environment is made available on a continuing basis to the public at the community and regional level in a readily understandable, acceptable and useful manner, and to provide a focus at the regional level for consultation and coordination with local and provincial organizations and community groups regarding matters relating to health risks in the environment.

There is a need to improve public understanding of the nature and magnitude of human health risks, the government programs designed to control these risks and the decision-making processes used in risk management. This information is necessary for an informed public, better able to make choices regarding protecting their own health.

Activities/main outputs

This Initiative was to start in 1994-95 with an initial budget of $400K and 8 P'S. Through re-profiling, this Initiative has not materialized.

Initiative 14: Active Living Environments Program (ALEP)

Objectives/description of initiative

The objective of the Active Living Environments Program is to support and encourage Canadians to engage in more responsible, more active and healthier outdoor physical activities that are environmentally friendly and to enhance their collective capacity to preserve or create healthier environments for active living. In addition, ALEP encourages Canadians to address environmentally-based health risks, in particular:

- *air pollution* by focusing on transportation to reduce car use and promoting biking and walking;
- *recreational water pollution* to influence individuals and communities to address barriers to recreational water quality;
- *sun*, by connecting with HPB to provide information and tips on sun safety to stakeholders/educators and to mobilize recreational leaders to take policy and program action regarding sun exposure; e.g., creating "shade" in playgrounds; and
- *pesticides*, by focusing on home gardeners and parks and recreation staff to encourage naturalization of backyards and parks.

Activities

The *Active Living - Go For Green!* program was initiated at the federal level in 1991, sponsored by Fitness Canada, as part of the National Health and Welfare Plan on Health and the Environment under the federal government' Green Plan. The four main objectives were partnership building, environmental experience, safe/accessible environments, and active transportation. Achievement of these objectives has been sought at the local level through community-based projects as well as through application of a number of strategic approaches as the national level. National projects were managed directly by Health Canada and the *Active Living - Go For Green!* office. Regional/community projects were managed by the *Active Living - Go For Green!* office in concert with provincial/territorial governments.

National projects were generally supported by in-kind contributions, while local activities were supported by grants. Projects were funded through block funding agreements with the provinces/territories (usually with the Ministries of Tourism and Recreation) according to a number of commonly held core national/regional criteria including:

- community-based;
- capability to reach a large number of people;
- public participation in planning and implementation stages;
- part of existing municipal-wide strategy (e.g., Recreation Master Plan, etc.);
- demonstrates collaboration, intersectoral cooperation (recreation, education, environmental, health, tourism, etc.);
- relevant to one or more of the four ALEP objectives;
- demonstrates sustained impact beyond 1997 (commitment, responsibility); and
- demonstrates a willingness to communicate the content and success of the project to other communities in Canada.

Financial Summary ($millions)

ALEP	91-92	92-93	93-94	94-95	95-96	96-97	Total
Initial	1.100	2.250	2.130	2.130	2.140	2.150	**11.9**
1st Res.	—	—	—	—	--	2.282	--
Reprof.		(0.250)	(0.400)	0.109	0.216	0.325	**0.00**
2nd Res.			(0.026)	(0.074)	(0.074)	(0.074)	**(0.248)**
($400K)		(0.013)					**(0.013)**
Dec.91/92	1.100	1.987	1.704	2.165	2.282	2.401	**11.639**
TB. 10%			(0.170)	(0.217)	(339)	0	**(0.387)**
3rd Res.			(O.044)	(0.044)	0	0	**0.088**
4th Res.			(0.530)	(0.053)	0	0	**0.583**
Cuts			0	(0.314)	0	1.605	**1.919**
Total	**1.100**	**1.987**	**1.490**	**1.851**	**1.943***	**0.796**	**9.167**

* does not reflect an $800K cut by senior management directive (i.e., actual current budget of ALEP is $8.367 million.

The information provided below reflects only the financial data for 1994/9. The data illustrates the breakdown between national and regional projects, as well as the type of project for that fiscal year.

- National Funding

This information was extracted from the National Strategy Framework chart .

National Strategy	Go For Green Funding $
Participation/Education	$164,000.00
Partnerships	$103,500.00
Active Transportation	$37,500.00
Safety Accessibility	$37,000.00
Total	$342,000.00

Provincial/Territorial Funding

Province/Territory	$ Approved 1994-95
Northwest Territories	$52,784.00
British Columbia	$69,260.00
Alberta	$48,000.00
Saskatchewan	$45,000.00
Manitoba	$51,650.00
Ontario	$108,800.00
Quebec	$90,000.00
New Brunswick	$34,000.00
Nova Scotia	$19,795.00
Prince Edward Island	$35,000.00
Newfoundland	$37,500.00
Total	$591,789.00

Clients/Stakeholders

This initiatives target clientele are the provincial and territorial governments, municipal and community leaders, and the entire Canadian population.

Accomplishments/Outcomes

The health risks identified are divided into two distinct areas:

Natural Environments:

This area include issues such as air and water pollution, UVA/UVB radiation and pesticide use. The priorities are to reduce air and water pollution, reduce exposure to the sun, and to reduce pesticide use.

Human built Environments:

This area focuses on housing, schools, workplaces, parks and greenspaces, transportation environments and community meeting places. The priorities are to reduce exposure to chemicals, promote safety and healthy activities and to monitor/improve air and water quality.

Systemic leaders include: planners, engineers, politicians, community leaders and the general public. The priorities to be addressed include accessibility, safety, Public Policy, Official Plans, Zoning Bylaws and individual and collective responsibility for community environments.

According to a recent evaluation of the ALEP, the following has occurred as a result of initiative activities:

- Provincial/territorial funding agreements have been established;
- Provincial/territorial Go For Green Networks (i.e., provincial and community organizations) have been established. According to the 1994-95 evaluation, there were 500 such networks.
- Canadian communities are actively engaged in Go For Green activities and registered. According to the 1994-95 evaluation, 700 communities were actively engaged in such projects.
- Local leaders (municipal officials, business leaders, etc.) are known to be committed to the continuation of Go For Green principles as is evident through local policies and programs (improved walking in winter, bicycle lanes, improved safety/accessibility in parks). According to the 1994-95 evaluation study, there were 3,500 such leaders.
- Canadians are being informed of the benefits of certain actions relative to active living, health and environmental citizenship. In the 1994-95 evaluation report, it was estimated that some two million Canadians have been reached by Go For Green messages.

The initiative has made significant progress towards partner network development at the national level. For example:

- a database for use by leaders at all levels (Partners) is under development and will contain information on all Active Living - *Go For Green!* community projects from across Canada. In addition, this information will be made available on the Internet;
- a fundraising strategy to assist partners to leverage funds from non-government sources up to and beyond 1997 as been developed. Eleven possible methods of fund raising were identified and discussed. An action plan has been developed to determine the viability and potential for the success of each method; and
- a working group has been struck to examine all possible ways to assist communities to measure the impacts of their local Active Living - *Go for Green!* actions. The group plans to look at participation, economic, health, policy and a wide range of other indicators.

There is also evidence that a number of ALEP activities have identified and communicated the health risks identified by Health Canada as part of the Initiative's goal. Most of the stakeholders interviewed, indicated that their projects had identified and communicated a number of health risks. These included:

- physical inactivity;
- air and water quality;
- exposure to UV radiation;
- exposure to pesticides; and
- exposure to toxic waste.

For example, in 1994-95, there were 201 Active Living - *Go For Green!* projects funded at the Provincial/Territorial level. The vast majority of these projects (76%) were directed toward the general public. Eighteen percent (18%) were targeted toward youth, while the remainder (6%) were designed for the disabled, seniors and families. The most popular activities supported under this initiative were:

- **Walking/hiking:** Sixty projects were directed toward trail clearing and development, or the installation of signage and benches.
- **Cycling:** Most of the 30 projects were focused on the safety/accessibility aspect of cycling - trail development and the installation of signage.

- **Cross-country Skiing:** The 27 projects funded were primarily involved in the development of multi-purpose trails which could be used by walkers all year, cyclists in the spring, summer, and fall, and cross-country skiers in the winter.
- **Education and Interpretation:** Forty-four projects education or interpretation of the environment. Some of the projects focused on specific education, while the remainder were associated with trail improvement, installation of signage, and brochure and program development.

Of the 56 national projects that took place in 1994-95, 48 (or 86%) were directed toward the general public. The remaining projects were directed at specific population groups (youth, seniors, women and the disabled). Twenty-four (24) of these projects focused on participation/education, 19 focused on partnership building, 10 focused on active transportation, and 3 focused on safety/ accessibility.

The Active Living Environments Program was successful in forming partnerships. Within the Provincial/Territorial program, encouraging partnerships at the project level was well done. In order to accomplish this, most provinces made specific mention in the criteria of the preference given to proposed projects that would be able to demonstrate some form of organizational or community partnership. The provinces and territories by all indications have appeared to remain consistent with their criteria in this regard, encouraging multiple partnerships. The ALEP process was credited with bringing different groups together to work toward a common goal.

The ALEP program has had a positive impact on Canadians' collective capacity to create or preserve quality environments for active living, and has encouraged Canadians to address environmentally-based health risks. This is evidenced by the following:

- There is a commitment by Provincial/Territorial governments and Networks to ALEP objectives.
- Targeted leaders, (municipal officials, business leaders etc.), are aware of the issues, and are taking action by implementing new policies/programs relative to the *Go For Green!* objectives. Examples include improved environments for Active Living (improved walking in the winter, bicycle lanes), and improved safety/accessibility features in parks.
- There is an improved awareness and understanding of the *Go For Green!* objectives among the targeted public (5 million Canadians), coupled with a positive behaviour change within this same group (2 million Canadians). An increased number of Canadians engage in positive behaviours vis a vis environmentally-based health risks

(e.g., more people cycling as an alternative to automobiles - reduced air pollution); more people are undertaking sun protection practices; and there is a decreased use of pesticides in parks and home gardens.

According the 1994-95 evaluation report, the following is a breakdown of the number of communities that participated in the Initiative activities, and the classification of the type of activity conducted.

Province/ Territory	# of communities	experience & education	safety/ accessability	active transportation	building partnerships	successful: yes/no/ limited
NWT	17	6	13	0	1	LIMITED
B.C.	18	8	16	1	5	LIMITED
ALTA.	25	9	19	0	5	YES
SASK.	1	0	0	0	0	LIMITED
MAN.	33	14	31	1	2	YES
ONT.	15	10	4	2	9	YES
QUE.	37	22	31	0	3	YES
N.B.	3	2	2	0	1	YES
N.S.	17	14	5	0	0	LIMITED
P.E.I.	11	2	11	2	0	YES
NFLD.	22	9	16	2	3	YES
TOTAL	199	97	148	8	30	

Initiative 15: International Liaison

Objectives/description of initiative

The objective of this initiative is to support Health Canada's involvement in international initiatives to reduce environmental risks to the health of Canadians and the citizens of other countries.

Activities

Four (4) projects were partially funded through APHE contributions under this Initiative. These were:

1. Hazardous Waste and Health Protection in Latin America and the Caribbean ($70K): This project involved the participation of WHO, PAHO, the Environmental Health Directorate at HPB. It was executed through the Regional Program on Hazardous Waste Control of PAHO. The project consisted of carrying out a survey of hazardous waste production arising from ten different industries, including health care facilities, judged to be the largest producers of hazardous waste. This survey was conducted in twenty-one Latin American and Caribbean countries. The study included the analysis of data on quantities of hazardous waste produced, their effluent treatment and hazardous waste disposal practices, as well as information on institutional and legislative aspects of national hazardous waste control activities in the region.

2. Assessment of Environmental Monitoring in Estonia ($20K): This project was carried out in collaboration with Estonia. It was administered by WHO-EURO which consisted of an assessment of the institutional structures and technical procedures for environmental monitoring in Estonia and included an evaluation of the quality of existing health data, the quality of lab methodology and availability and quality of referencing standards. The funding of $20K was for Phase I of a $36K project.

3. Latin America Household Water Filtration Project ($80K): This project was carried out by the International Development Division of the University of Calgary in collaboration with PAHO in Nicaragua and Honduras.

   This project was the second phase of an initial project which developed and installed four household intermittentently operated slow sand filters (IOSSF) in a community in Nicaragua. The importance of these filters is to provide communities with clean water free of cholera (48% of the entire population of Nicaragua cannot be adequately served by any existing or proposed potable water supply problems and cholera epidemics are common and devastating to the Nicaraguan communities in which they occur). The advantage of this filtration system is that it does not need continual management; i.e., can be turned off and on (possible application for reserves in Canada) The pilot had demonstrated clear health benefits from this technology - the site of the pilot was the only cholera-free rural community in Nicaragua.

The specific objectives of this project were as follows:

- to evaluate the technical performance of IOSSF technology in rural communities in Nicaragua;
- to evaluate community acceptance of IOSSF technology;
- to evaluate the impact of IOSSF technology on community health and quality of life;
- to formulate, based on the above, recommendations regarding the use of IOSSF technology in rural communities in Nicaragua;
- to train Nicaraguan professionals and technicians in IOSSF technology and technical development methods; and
- to strengthen Nicaraguan and Canadian universities in their capacity to investigate, evaluate and teach water and sanitation technology.

One or more communities were to be selected for evaluating filter use. At least 30 households, appropriately trained, would use the filter in each community. Filter performance, design and acceptance was to be monitored. Group interaction among filter users was to be encouraged. Filter design and operation modifications were to be recorded and immediately implemented where practical.

4. Emerging Diseases ($80K): This project was carried out in coordination with Health Canada's Laboratory Centre for Disease Control in partnership with the World Health Organization (WHO) in Geneva and the Pan American Health Organization (PAHO) in Washington. (At the time of this report, external contacts have failed to supply documents on the activities and hence results of this project.)

Clients/Stakeholders

Initiative clients and stakeholders include Foreign Affairs Canada, WHO, PAHO, residents and industry in the countries where projects were conducted, the scientific community, as well as potential beneficiaries of spinoff activity (e.g., First Nation peoples on reserves).

Accomplishments/Outcomes

The major accomplishments of this initiative are as follows:

As a result of the four projects carried out in the International initiative, the following has occurred:

1. Hazardous Waste and Health Protection in Latin America and the Caribbean

   The project has been completed as contracted and a report, *"Hazardous Waste and Health in Latin America and the Caribbean"*, PAHO; Washington, D.C., 1994., has been produced. This report has become a part of PAHO's series of publications which call attention to environmental health problems. Due to high demand, it is now in its third edition and has become a tool for decision-makers in government.

   The results of this project generated hard data which can be used for health interventions and have led to other spin-off activity including:

   - specific projects conducted by a German CIDA-like organization; e.g., a guideline for classification of waste according to health risk is being produced which has never done before;
   - established a network among the different institutions in the 10 countries surveyed to assist in the management of hazardous waste in a safe and healthy way; and
   - training by the U.S. Environmental Protection Agency in hazardous waste management using PAHO's infrastructure.

2. Assessment of Environmental Monitoring in Estonia

   The project was completed as contracted and there were three reports produced:

   - *"Assessment of Environmental Monitoring in Estonia"*, Agreement Report, August 1993;
   - WHO Mission Report, *"Assessment of Environmental Monitoring in Estonia"*, June 1993; and
   - *"Environmental Health Services in Europe Survey on Environmental Health Services in Estonia"*, Sept. 1993.

   Although the project concluded that the environmental monitoring data generated by the former U.S.S.R were unreliable and incomplete, interviewees felt that the information gathered was valuable. In their opinion, the activities of the project have:

- created awareness on the part of the Estonians on Western procedures which have led to improvements in their methods; and
- provided basic monitoring equipment to Estonian government counterparts.

Although there was a decision to cut off this project at the end of Phase I, the experience led to funds from Foreign Affairs to help train Estonians in environmental monitoring techniques.

3. Latin America Household Water Filtration Project

The project has been completed as contracted and a report is pending.

To date, the project has resulted in:

- the setting up of two factories to manufacture these filters;
- the training of a number of locals in the technology;
- moral support from the Nicaraguan Minister of Health; and
- a number of spin-offs for the contractor including:
    - a working relationship with the International Development Research Centre (IDRC) and Samaritan's Purse (a Calgary-based NGO) to pursue a national project in Nicaragua;
    - installation of seven of these filters on the Bonaparte First Nation Reserve in January of 1996;
    - a pilot project for Agriculture Canada (potential for use of these filters by farmers);
    - interest from Chile; and
    - orders from cottagers/farmers for these filters.

4. Emerging Diseases ($80K): (not yet available at the time of writing this report).